Establishing local ELA and landscape analysis in connection with tectonics and climate: Muji region, Western Tibetan Plateau

A Thesis

Presented in partial fulfillment of the requirements
for the degree of Bachelor of Science
in Geological Sciences

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June 2008

Approved by

Abstract

Glaciers play an important role in shaping the landscape. In The Muji region of western Tibet, approximately 100 alpine wet-based glaciers are shaping its landscape today. This study established a local Equilibrium Line Altitude (ELA), or snowline, for each glacier within the Muji Region of the western Tibetan Plateau. The Muji region is an ideal locality to observe the interactions between climate and tectonics because it is at the intersection of the mid-latitude westerlies and variable tectonic uplift due to normal faulting along the Kongur detachment. The importance of the ELA is that it changes with climate and tectonic activity. For example, if the climate gets colder the ELA is lowered. In addition to establishing the local ELA, a landscape analysis was performed for each of the glaciated valleys in order to compare the ELA with the landscape. A correlation of ELA with mean topography suggests the operation of the glacial buzz saw. The glacial buzz saw hypothesis states that glaciers plane the mean elevation of the landscape to the ELA.

The hypotheses tested include 1) the ELA controls the mean elevation of a landscape and 2) glacial characteristics are partly controlled by tectonics. In order to test these hypotheses, current ice coverage was mapped using satellite imagery, slope map and a digital elevation model. The ELA was calculated by mapping the extent of glaciers and performing an accumulation area balance ratio calculation. The landscape analysis will consist of constructing swath profiles for each glaciated region. The landscape analysis looked for correlation among ELA, tectonics and glacial characteristics.

A simple initial observation is the presence of much larger glaciers on the leeward side of the Muji range than on the windward side. High rates of snow and ice removal by the westerlies on the windward side of the range lead to immature glaciers. This results in much smaller, closely spaced glaciers. In contrast, the leeward side experiences much more deposition of snow and ice which results in much larger, widely spaced mature glaciers. The glaciers on the leeward side of the Muji Range are responsible for the majority of local glacial erosion. ELA data suggests the climatic gradient is perpendicular to the Muji range, while the tectonic gradient in dominantly parallel to the Muji Range. Glacier characteristics showing similar attributes but drastically different ELAs suggest a tectonic control on glacier characteristics.

Acknowledgements

I would like to thank my advisor, Dr. Lindsay Schoenbohm, for the opportunity to work on an exciting project such as this one. Dr. Schoenbohm would meet with me weekly to talk about the progress of the project and see if there were areas causing confusion. I have benefitted greatly from her mentorship. I would like to thank the professors in the School of Earth Sciences for their dedication to the undergraduate curriculum and the promotion of research. Most notably, Dr Terry Wilson, Dr. David Elliot, and Dr. Berry Lyons have greatly contributed to my undergraduate development. I would like to thank the Honors Arts and Sciences department for their support of my project. I thank the many undergraduate and graduate students of the School of Earth Sciences of The Ohio State University for their support and friendship. I thank them for helping me understand the balance between work and play. I would like to thank The Ohio State University for maintaining a great learning environment and encouraging and supporting undergraduate research. Finally, I would like to thank my mother, Donna, my father, Jim and my sisters Jennifer, Jocelyn, and Janessa for their lifetime love and support. I dedicate this research to them.

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Introduction

The Muji range of Western Tibet is an ideal area in which to investigate the interactions between climate and tectonics due to the presence of extensive glaciation and variations in climatic and tectonic signals. The climate of the region is dominated by warm moist air of the mid-latitude westerlies which brings moisture from the Mediterranean Sea (Miehe et al., 2001). Structurally, the region of western Tibet lies within the western syntaxis of the Himalayan mountain chain (Fig. 1). The western syntaxis is characterized by intense deformation associated with vertical extrusion due to topographic collapse or mountain building processes (Fig. 2; Robinson et al. 2004). Directly to the south of the Muji Range, lie Kongur Shan and Muztagh Ata massifs, areas of extreme relief and extensive glaciation which potentially represent an area of climatically enhanced uplift called a "tectonic aneurysm." (Schoenbohm, in press). With variable climatic influences and different tectonic signals, the Muji Range provides a suitable environment in which to analyze a climate-tectonic coupling. This study will seek to establish the controlling factors in the evolution of the landscape in terms of glacial characteristics, geology, and topography.

In order to investigate the climate-solid earth interplay, I mapped 108 glaciers on both the northeast and southwest flanks of the Muji Range. For each glacier I determined glacial characteristics such as the area, spacing and amount of debris cover and established an Equilibrium Line Altitude (ELA used as a climatic indicator), compared ELA with the mean elevation of the landscape and analyzed geological observations from Robinson et al. (2004). Results suggest that the prevailing westerlies and tectonic uplift

rate control glacial characteristics. The downwind flank of the Muji region receives snow and ice through snow drifting blowing over the range by the westerlies. The southern segment shows glaciers increasing in size in response to higher rates of uplift as compared with the glaciers of the northern segment. The glacial buzzsaw hypothesis suggests that glaciers actively erode the landscape to the ELA and essentially match erosion with uplift (Brozovic et al. 1997). Two regions, the Bend and Dome, show a correlation of ELA with mean elevation which suggests that the glacial buzzsaw is operating in these areas.

Background

Geographic setting/overview

The Muji range (Fig. 1) lies at the extreme western border of China (39° N, 74°45' E). It lies south of Kyrgyzstan and east of Tajikistan. The Tarim basin is ~250 km south east of Muji. The Muji range is bounded by the Kongur detachment, an extensional fault associated with the exhumation of the Chinese Pamir, including the Muji Range, Kongur Shan and Muztagh Ata, forms the western boundary of the entire range and continues south of the massifs (Robinson et al. 2004). The ~ east-west flowing Gez River, which dissects the Muji range north of the Kongur Shan massif, is responsible for removal and evacuation of sediment once the glaciers deliver it to the river. Although the trend of the Muji range is roughly northwest-southeast, the change in tectonic signal is roughly north-south and the climatic gradient is roughly west-east. In this representation, quadrant I corresponds with the southern downwind flank, quadrant II with the northern downwind flank, quadrant III with the northern, upwind flank and quadrant IV with the southern,

upwind flank (Fig. 3). Two anomalous regions called the Bend and the Dome lie in between the northern and southern segments (Fig. 3).

Tectonic Setting

Robinson et al. (2004) investigated the structural and geologic components of the Muji range (Fig. 4). The Muji range, as stated above, lies within the western syntaxis of the Himalaya. Major features of this region include the Main Pamir Thrust to the north, the Karakoram strike slip fault to the south and the Kongur Shan extensional system (KSES) which lies completely in this study's field area. The Kongur Shan extensional system is most likely the result of vertical extrusion due to topographic collapse, radial thrusting along the Main Pamir Thrust, or oroclinal bending of the entire Pamir region (Robinson et al. 2004). The north-south trending Muji-Tashkorgan valley stretches 250 km and has over 4 km of relief. The Kongur Shan extensional system bounds the Muji-Tashkorgan valley and has four main segments based on orientation and style of movement. The 60 km long, south-southwest dipping Muji fault is the northernmost segment of the KSES. It is characterized by right slip at its northern edge and normal extension at its southern end. Additionally, Robinson et al. (2004) found that at its eastern edge, the Muji fault changes from west-northwest striking to north striking becoming the Kongur Shan normal fault. The area called "The Bend" in this study includes many high angle westward and eastward dipping normal faults in addition to low angle thrust faults (Fig. 5B). The Kongur Shan normal fault continues for ~150 km, to the south, dipping 35° to 45° to the west-southwest. The fault dies out approximately 45 km south of Muztagh Ata

and transfers extension to the Tashkorgan normal fault for another ~50 km until topography is subdued and the fault trace becomes hidden.

Geologic Setting

Robinson et al. (2004) discuss the local geology of the Muji range (Figs. 4 and 5). The hanging wall throughout the Muji valley consists of two distinct units: (1) a structurally higher metasedimentary unit, Pz_{sch1}, which is intruded by granitic bodies, and (2) a structurally lower metagraywacke unit, Pz_{gw1}. Footwall geology consists of three distinct units: (1) a structurally higher metasedimentary unit, Pz_{sch}, which is exposed along the Muji fault and the Qimugang Creek portion of the Kongur Shan fault, (2) a structurally lower metagraywacke unit, $Pz_{gw,}$ and (3) the structurally lowest unit, Pz_{gn}, which is a medium-grained, quartzofeldspathic, mylonitic gneiss with minor layers of quartz and biotite schist. Igneous bodies of the area are correlated with plutons of the Late Paleozoic-early Mesozoic South Kunlun terrane (Pan, 1992, 1996; Youngun and Hsu, 1994; Matte et al., 1996). At the core of the Kongur Shan massif, thick (>1km thick) granitic sills with well-developed mylonitic fabrics are interlayered with Pz_{gn} (Fig. 5A). North of the Gez river, thinner (<100 m thick) granitic sills are found within the Paleozoic gneisses, Pz_{gn}, and decrease in thickness and abundance to the north (Fig. 5C; Robinson 2004).

Climatic Setting

Climatically, the Muji region is primarily influenced by the mid-latitude westerlies which bring moisture from the Mediterranean Sea (~4000km west), the Caspian Sea (~2000km

west) and the Black Sea (~3400km west)(Aizen and Aizen, 1997). At the Bunlun Kol weather station (38°44`N, 75°02`E), the annual temperature is 0.7° C and the mean annual precipitation is 127 mm (1956-1968; Seong et al., 2007). The annual peak in rainfall coincides with the northward migration of the Intertropical Convergence Zone (ITCZ) during the late spring to early summer months of April and May (Miehi et al., 2001). Aizen et al. (2001) found a lack of marine salts in the snows of Muztagh Ata which suggests that the mid-latitude westerlies, not the Indian monsoon, supply precipitation to the area.

Seong et al. (2007) investigated the glaciology and paleo-glacial landforms in connection with tectonics of the Kongur Shan and Muztagh Ata massifs and noticed that the style of glaciation has changed due to a reduced supply of moisture to the area over the last 340 ka. He suggests that uplift of the Himalaya, Pamir and Karakoram ranges steadily restricted the precipitation contribution of the Indian monsoon and the mid-latitude westerlies. By mapping the glaciers and determining an ELA, Seong was able to show a correlation between greatest elevation frequency (hypsometry) and the ELA. This supports the glacial buzz-saw hypothesis that says glaciers rapidly erode the landscape to the elevation of the ELA.

Tectonic-Climate Coupling: Glacial Buzzsaw and Tectonic Aneurysm

Schoenbohm et al. (in prep) investigated the extent of glaciation in the Muji Range by mapping moraine deposits interfingered with cut-and-fill fluvial terraces. Cosmogenic ^{10}Be dating of moraines and terrace surfaces suggests that glaciers did not advance beyond the mountain front before 39-58 ka. This is in contrast with the Kongur Shan massif which was investigated by Seong et al. (2007). Cosmogenic radionuclide dates of the geomorphology of moraine deposits within the Kongur Shan massif suggest extensive

glaciation and potentially development of an ice cap from 305 ka to 114 ka. One interpretation for the contrast points to changing sources of moisture both spatially and temporally resulting from progressive tectonic uplift. Since the annual mean temperature is low (0.7° C), glaciation in this area is likely to be more sensitive to moisture levels than to temperature changes (Seong et al. 2007). Glaciation of the Chinese and Tajiki Pamir coincides with the Northern Hemisphere glacial events while events in the Himalaya and Eastern Tibet coincide with the Indian monsoon with ~ 23 ka cyclicity (Seong et al. 2007; Zech et al. 2005; Bond et al. 1997; Owen et al. 2005; Schoenbohm (in prep)). While the mid-latitude westerlies are responsible for delivering the majority of moisture to the area, Schoenbohm et al. (in prep) suggest that the monsoon did play an active role in the past. The monsoon would enter from the south and intersect the Muztagh Ata and Kongur Shan massifs first, thus leaving little moisture for the Muji Range. The lack of monsoon influence is one of the lines of evidence suggesting a decoupling of climate and tectonics. The monsoon was essentially blocked with uplift of the Kongur Shan and Muztagh Ata massifs. Once the monsoon was blocked the region would receive much less precipitation thus reducing the growth environment of glaciers.

Glaciers are argued to have a strong role in shaping the landscape and determining its mean elevation. The Equilibrium Line Altitude (ELA) is an altitude on a glacier where accumulation and ablation of snow and ice is in equilibrium (Benn and Evans, 1997). The ELA is closely connected with local climate, particularly precipitation and temperature. It is sensitive to small changes in either variable and rises in response to decreasing snowfall or warmer temperatures (Benn and Evans, 1997). The ELA also has tectonic implications. If the landscape is uplifted, an area that was in the ablation

zone before uplift moves into the accumulation zone, lowering the ELA in a relative sense within the landscape. Additionally, Brozovic et al. (1997) show that the mean elevation of mountain belts, once they are extensively glaciated and if precipitation is abundant, is a function of ELA, not uplift rate. One suggestion for this relationship is that the ELA represents the altitude on a glacier where erosion is most effective (Brozovic et al. 1997). It is the altitude on a glacier that experiences the greatest flux of snow and ice. This suggests that erosion is highest at the ELA. The long term mean ELA forms an upper envelope on topography (Brozovic et al. 1997). This has been called "glacial buzz saw" by many researchers investigating the climate-tectonic coupling. It relies on the fact that glacial erosion is most effective at the ELA. The greatest flux of snow and ice within a glacier is found at the ELA (Brozovic et al. 1997).

Another hypothesis for the regional contrast in glaciation and relief suggests a positive feedback between climate and erosion. Molnar and England (1990) found that glacial erosion causes mass removal, producing relief and causing isostatic peak uplift. These peaks (Kongur Shan and Muztagh Ata) produce orographic precipitation acting as "topographic lightning rods" (Schoenbohm et al. in prep; Brozovic et al. 1997). South of the Muji range, precipitation levels may have been high enough to couple erosion, exhumation and relief production to produce a tectonic aneurysm. Schoenbohm et al. (in prep) suggest once this aneurysm has started, it is a self-sustaining system. The tectonic aneurysm model suggests that under rapid, focused erosion the crust of the earth will weaken while the upper crust is eroded off (Zietler et al., 2001). Weak lower crustal material flows into the weaker zone causing uplift. The model also suggests that this uplift will be focused. Recent investigations in rugged landscapes have shown that the form of the landscape is due to glaciation not exhumation (Brozovic et al., 1997). In mountain

belts that intersect the ELA, glacial and periglacial processes keep altitude, relief and development of topography in check regardless of tectonic uplift rate (Brozovic et al. 1997).

The goal of this research is to investigate the ELA, landscape and geology in the context of the hypotheses outlined above to further understand the history of the Muji range and implications for the potential of climate-tectonic coupling.

DATA

I analyzed each glacial valley using 90 meter SRTM digital elevation data (DEM), a slope map derived from the digital elevation data, ASTER 15 meter resolution satellite imagery, Quickbird imagery available from Google Earth, and Chinese topographic maps. Using the software ArcGIS, I first mapped every glacier in the Muji Valley. Second I measured the area and assigned a debris cover index for each glacial valley. Third I determined the local Equilibrium Line Altitude for each glacier. Finally, I analyzed valley spacing and correlated ELA with topography via swath topographic profiles using the digital elevation data. The map area can be broken up into 6 distinct regions. Quadrants I and II occupy the north and south segments of the downwind flank of the Muji range respectively while quadrants III and IV occupy the north and south segments of the windward flank. The Bend region lies directly between QIII and QIV while the Dome lies slightly eastward between QI and QII.

Glacier Mapping

Methods

Through the use of ArcGIS software, I analyzed a 90 meter SRTM DEM, a slope map, and an ASTER satellite image. Regions of cloud cover, shadows and poor resolution were cross referenced with Quickbird imagery available for some regions in Google Earth. Using primarily the slope map and satellite images I mapped the aerial extent of each glacier. Notable difficulties, such as determining the precise terminus of debris covered glaciers and the snow-ice boundary on steep headwalls, can make mapping glaciers with remote sensing difficult but the slope map helps show breaks in slope and valley spacing. In order to analyze debris cover, I developed a Debris Cover Index (DCI) in which I assigned a value of 0 to a glacier whose aerial extent is 0-20% debris covered, a value of 1 to a glacier that is 20-40% covered and so on up to a value of 5 which represents 80-100% covered (Fig. 6). The importance of the DCI is that a glacier with a high DCI will experience an insulating effect by the debris blanket. If a glacier has an insulating cover, it will be able to mature thus allowing a greater time to erode the landscape. This was done by comparing covered area to total glacier area. Valley spacing was roughly determined by counting the number of glacial valleys over the distance of the region.

Results

Quadrant I (Fig. 7) contains ~6 large glaciers (~12 ±9 km^2) which are extensively debris covered (DCI 3-5) and widely spaced valleys with 6 valleys over 30 km for an average

spacing of 5.0 km. This area contains one reconstituted glacier which is glacier formed below the terminus of a hanging glacier by the accumulation, and reconstitution by pressure melting (regelation), of ice blocks that have fallen and/or avalanched from the terminus of the hanging glacier (USGS, glossary of glacier terminology). Quadrant II (Fig. 8) contains 26 medium sized glaciers (7.4 ± 7 km^2) which are moderately debris covered (DCI 2-3) and widely spaced valleys with 26 valleys over 50 km for an average spacing of 1.9 km. 3 glaciers in QII have areas over 25 km^2.

Quadrant III (Fig. 8) contains ~30 clean (DCI 0-1), small glaciers (2.4 ±1.9 km^2). With 30 glaciers in about 40 km, Quadrant III shows the highest number of glacial valleys of the 6 regions with an average spacing of 1.3 km. QIII contains one large glacier (~8km^2) which has been decapitated (had its headwall removed) by a glacier in QII (Fig. 9). Quadrant IV (Fig. 7) contains 11 moderately clean (DCI 1-2), medium sized glaciers (9.6 ±6 km^2). QIV contains 11 glaciers over ~30 km with an average spacing of 2.7 km.

The Bend region (Fig. 10) consists of 12 glaciers with 9 on the west side and 3 on the east side. The average area is near 7 km^2 for the western flank and near 12 km^2 for the eastern flank. Debris covered indices vary widely from 0-4. The glaciers show tight knit groups of glaciers rather than distinct individual glacial valleys, which makes it difficult to determine valley spacing with our current methods. Roughly, there are 5 major glacial valleys over a distance of 30 km with an average spacing of 6 km.

The Dome region (Fig. 10) contains 18 moderately clean (DCI 1-2), small (2.4 km^2) glaciers in a distinct radial pattern. One glacier, on the lee side of the Dome, is anomalously large (~14 km^2) with an extremely steep headwall.

ELA

Methods

The many methods of determining ELA vary in their ease of calculation, accuracy, necessary inputs, and validity. The most rigorous way to determine the ELA of a glacier is by measurement of glacier mass balance in the field (Benn and Evans, 1997). Although this is the best way to accurately determine the ELA, it requires annual measurement of ELA over a "standard decade" and mass balance data therefore exist for only a small number of glaciers worldwide (Benn et al. 2005). An alternative is the Area x Altitude Balance Ratio Method (AABR). This method originally devised by Kurowski (1891) takes a trial value for the ELA, and then multiplies the areas of successive contour belts (an area bounded by successive contour lines) by their mean altitude difference above or below the trial ELA (Osmaston, 2005). The algebraic sum of these indicates whether the trial ELA should be moved up or down, and the calculation is reiterated until a zero sum is obtained (Osmaston, 2005). In order to carry out this calculation, a balance ratio must be chosen based on glacial characteristics. The balance ratio, which is the ratio of mass balance gradient of the ablation area to the mass balance gradient of the accumulation area, has been found to range from 1.8 (Furbish and Andrews 1984) to 25 (Francou et al., 1995). For this study we chose a balance ratio of 2 to facilitate comparison with data from Seong et al. (2007).

In order to determine a contemporary ELA for each glacial valley, I mapped each glacier then, using DEM derived topographic lines, split each glacier into area polygons with different altitudinal range (Fig. 11). By inputting area-altitude data and applying a

balance ratio of 2 to a spreadsheet designed by Osmaston (2005), I was able to determine an ELA.

Results

ELAs for the Muji Range vary widely on an east-west transect but do not significantly vary north to south. Quadrants I (Fig. 12) and II (Fig. 13) show similar mean ELAs of 4512 m and 4337 m respectively, while Quadrants III (Fig. 14) and IV (Fig. 15) show much higher mean ELAs of 5277 m and 5274 m. The Bend (Fig. 16) region shows a similar east-west contrast with an average ELA of 5216 m for the west and 4554 m for the east side. The Dome region (Fig. 17) displays average ELA of 4368 m which is similar to the ELAs of QI and II.

Landscape Analysis

Description/Methods

In order to make interpretations regarding the glacial buzz saw and the tectonic aneurysm hypotheses, I constructed topographic swath profiles perpendicular to the trend of the Muji Range (Figs.19-21). This was done using the SRTM DEM in conjunction with a swath extraction program (pers. comm. Eric Kirby) to read the DEM and create a profile showing the mean altitude of the region chosen. A topographic profile is a measurement of elevation along a single cross section line. A swath topographic profile is the maximum, minimum and the mean elevation of an area projected onto one cross section line. The importance of a swath profile is that it produces a more representative sample

of the landscape. By displaying average high, mean and low topography, a proper representation of the landscape is given.

Results

East-west topographic swath profiles, perpendicular to the range (Figs. 19-21) show a correlation between ELA and the mean altitude of the landscape only in the Bend and Dome regions (Fig. 20). The topographic profiles and ELAs of the northern two quadrants and the southern two quadrants do not show a correlation. The ELA is too low to show a correlation. A correlation is shown when the ELA lies directly on top of the mean elevation of the glaciated zone. The glaciated zone spans the range crest on both sides.

Discussion/Regional Implications

Tectonics North vs. South

The tectonics varies north to south with dominantly strike-slip faulting in the north and extensional faulting in the south. The result is that the south segment experiences a higher rate of uplift than the northern segment. Valley spacing, glacier area and debris cover generally increase from north to south while ELA does not vary significantly (Table 1). The north to south consistency in ELA suggests that the difference in glacier characteristics is due solely to tectonic controls not climatic. The north to south increase in size suggests that glaciers adjust their size to keep up with uplift. Larger glaciers result in wider valley spacing. Deeper, longer glaciers also tend to have steep head and side walls resulting in higher debris cover.

Tectonics West vs. East

The Kongur detachment extensional fault lies on the western edge of the Muji region. The uplift rate is higher closer to the fault, therefore the glaciers on the western flank of the Muji range experience more uplift than the glaciers on the eastern flank. Glaciers on the western side form on the smooth, exposed, westward-dipping exhumed fault plane of the western flank of the Muji range. These glaciers get advected up the fault surface as faulting progresses and are unable to gain a foothold. Since the glaciers are supplied with fresh snowfall and they occur high on the topographic profile, they easily transfer snow and ice, aided by the westerlies, to the other side of the range. The eastern glaciers experience a lower uplift rate and are able to establish themselves better. With debris cover, headwall shading, and lower uplift rate the glaciers are able to mature. The observed contrast in glacial characteristics, consisting of small, immature glaciers on the windward flank and large, mature glaciers on the downwind flank, represents a tectonic control on glacial growth and maturity. The glaciers on the windward flank experience more uplift and snow loss due to drifting and avalanching therefore they are unable to mature.

Climate west vs. east

It is suggested that the ELA will fall with increased snowfall; therefore one would expect that the ELA on the windward flank of the Muji Range would be lower than the lee or rainshadow side (Benn and Evans, 1997). Our results show the opposite: ELA is high on the windward side and low on the lee side. One interpretation is that snow drifting from

the western to the eastern flank and avalanching within the eastern flank is a major contributor to glacier maturity. Brocklehurst (2005) found that whereas fluvially-eroded landscapes tend to be exhumed more on the windward side, glacially-eroded ranges seem to experience greater erosion on the leeward side. In mountain ranges that cross-cut the prevailing winds, the greater erosion on the leeward side reflects snow blown over the range crest (Brocklehurst 2005). Brocklehurst (2005) suggests this essentially has the opposite effect from orographic precipitation in non-glaciated ranges. The snow blown over the range allows the glaciers to mature and erode more effectively both in the valley floor and into the headwall. During headwall erosion on the eastern flank, steep slopes enhance avalanching which contributes to a debris cover. The glaciers that carry an insulating cover will experience a much more effective growth environment thus being able to have a more effective erosional history.

ELA and Landscape

The glacial buzzsaw hypothesis suggests that glaciers place a limit on topography by leveling the landscape to the elevation of the ELA (Brozovic et al. 1997). By comparing the mean elevation of the landscape with the ELA, we expect the mean elevation to correlate directly with the ELA. The Bend and Dome regions show this correlation. Seong et al. (2007) found paleo-ELAs of 3600-4100 m and 4400-4800 m asl for the Kongur Shan region by mapping glacial geomorphic features in correlation with the mean altitude of the landscape. If glaciation were more extensive in the past, it is more likely that the landscape of the Muji region was shaped according to the previous glacial extent. The paleo-ELA was lower and the landscape could have been shaped by the ELA during

the last glacial maximum. Seong et al. (2007) found paleo-ELAs of the Kongur Massif much lower than the present day ELA. A similar relationship between paleo-ELA and contemporary ELA may explain the lack of correlation with the landscape.

Another possibility for a lack of correlation between mean elevation and ELA is the adequacy of swath profiles for landscape analysis. Instead of swath profiles, Brozovic et al. (1997) and others use hypsometry to analyze the landscape. Hypsometry is the frequency distribution of elevation over an area. This is more reliable because it takes the entire area of the landscape into consideration instead of a particular area linked to a predefined topographic profile line. In future studies of the Muji region, I would try to implement use of hypsometry to produce a more robust representation of the landscape.

The Bend

The area called the Bend is a striking feature of the Kongur Shan fault in map view. Robinson et al. (2004) notes that the eastern terminus of the Muji fault, the fault system changes abruptly from west-northwest striking to north striking, becoming the Kongur Shan normal fault. Robinson et al. (2004) does not offer a hypothesis for this abrupt change in orientation. Figure 5C shows the complex nature of The Bend. High angle normal faults and low angle thrusts suggest a propagation of the Kongur Shan extensional system. Similar bends have been observed in the Kongur Shan and Muztagh Ata regions but it is unclear if they are related. The Bend represents the area of the most direct interaction with the westerlies because the trend of the area is more directly north-south thus allowing the westerlies to interact perpendicular to the range as opposed to oblique

as in the regions to the north and south of the bend. Flowing directly into the range, snow is dropped on its windward side and due to its broad, high topography snow drifting to the lee side is less evident here. Without drifting, the glaciers on the windward side show their ability to erode the landscape by the development of very large, tighter grouped glaciers. ELA and mean topography of this area correlate, which suggests operation of the glacial buzzsaw.

The Dome

The region to the northeast of The Bend is called the Dome due to its topographic expression and radial glacial pattern. The Dome is home to 18 glaciers of small size and moderate DCI. It is unclear how moisture is being delivered, but one observation suggests that an area of low topography with a wide valley within the Bend creates a wind gap and effectively passes through or over the Muji range and deposits snow directly on the slopes of The Dome. Regardless, moisture is penetrating through the Muji Range. Robinson et al. (2004) did not include the Dome in his interpretations; therefore one can only speculate on the structural and geologic makeup of this area. Nevertheless, the topographic profile of The Bend and The Dome, suggest that some structural feature is responsible for such an anomalous zone of increased elevation far from the Muji Range divide. With anomalous high elevation east of the Muji Range, radial glacial pattern, correlation of ELA with average elevation of the landscape and a potential presence of high angle normal faults subparallel with the Kongur Shan fault, suggest this domal structure could represent a paleo-Bend and westward propagation of the Bend and Kongur Shan fault. Potentially, the Dome was the initial expression of the Bend. Over

time, tectonic forces have propagated the deformation front westward producing the Bend. The opposite, that is the eastward propagation of the Kongur detachment, could also be true. The Dome has some connection with the Bend and the Kongur detachment but in order to establish that connection, more detailed mapping of the geology and structure of the Dome region is necessary.

Another potential interpretation of the Dome region is that it may represent a failed tectonic aneurysm. Once the Kongur Shan and Muztagh Ata "tectonic lightning rods" captured all the significant moisture from the monsoon, the Dome lost its sustaining power. Glaciation history of the Chinese Pamir suggests more extensive glaciation in the Kongur Shan and Muztagh Ata compared with the Muji region. The northward decrease in monsoon influence over time, due to lower sea surface temperatures or to topographic blocking by the high peaks of the Himalaya, Karakoram, and Pamir mountains, plays a significant role in the glaciation contrast and could account for the Muji regions inability to establish extensive glaciation to develop a tectonic aneurysm.

Conclusions

The Muji region represents a landscape shaped by the forces acting on it. The mid-latitude westerlies bring moisture to the area and set up a climatic gradient perpendicular to the Muji range. Tectonic forces are subjecting the Muji range to variable forces with strike-slip motion in the northern segment and extensional faulting in the south. The glaciers are responding to this variable tectonic signal by adjusting their size to the amount of uplift.

ELA contrast and glacial characteristics such as spacing and area are controlled by tectonic activity. The ELA shows large contrast perpendicular to the range but no contrast parallel to the range which is due transfer of snow and ice over the range via drifting and avalanching by the westerlies thus making the ELA higher on the western side. Lower uplift and higher rates of snow and rock accumulation allow the glaciers on the downwind flank to mature and become effective erosive agents. Spacing and area seem to be controlled by tectonic uplift. This is supported by the presence of small, closely spaced glaciers in the northern segment, where there is little uplift, while in the south where uplift is much higher, the glaciers are much larger and more widely spaced.

Observations suggest that the Muji region shows connections between the climate-tectonic system. Although the ELA correlates with the mean topography of the Bend and Dome, it does not mean that a tectonic aneurysm is taking place but it does suggest a potential glacial buzzsaw situation. The buzzsaw hypothesis is supported by a correlation between the ELA and the mean elevation within the Bend and Dome. This region represents an area of complex tectonic forces coupled with glaciation that has leveled the average elevation of the landscape to the ELA. Through this study, we have learned a significant amount about the tectonic-climate coupling of the Muji region and have hypothesized about the regional implications of our results.

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Figures

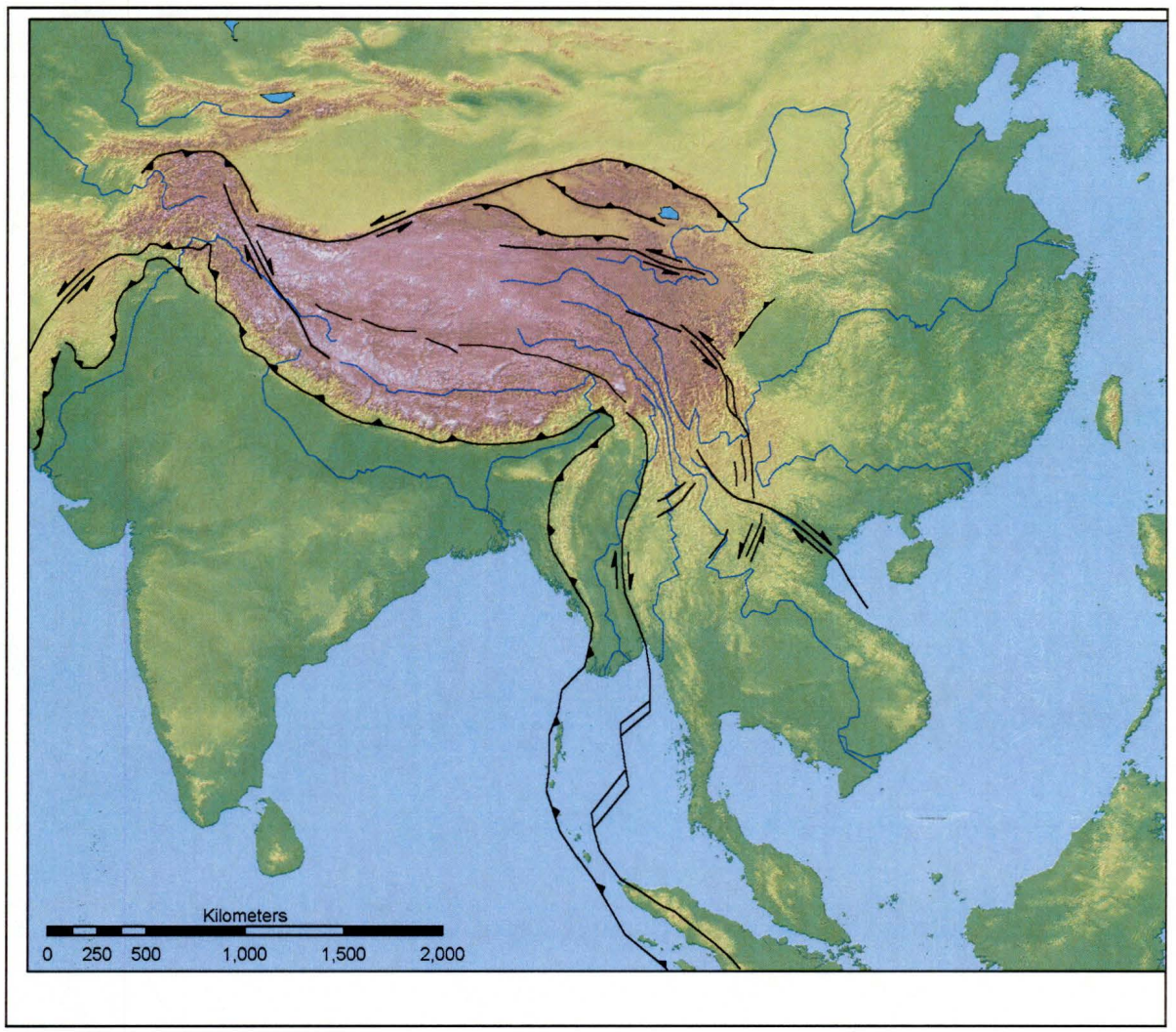


Figure 1. Regional digital elevation map of Indian-Asian continent showing major tectonic structures. Western syntaxis shown in box.

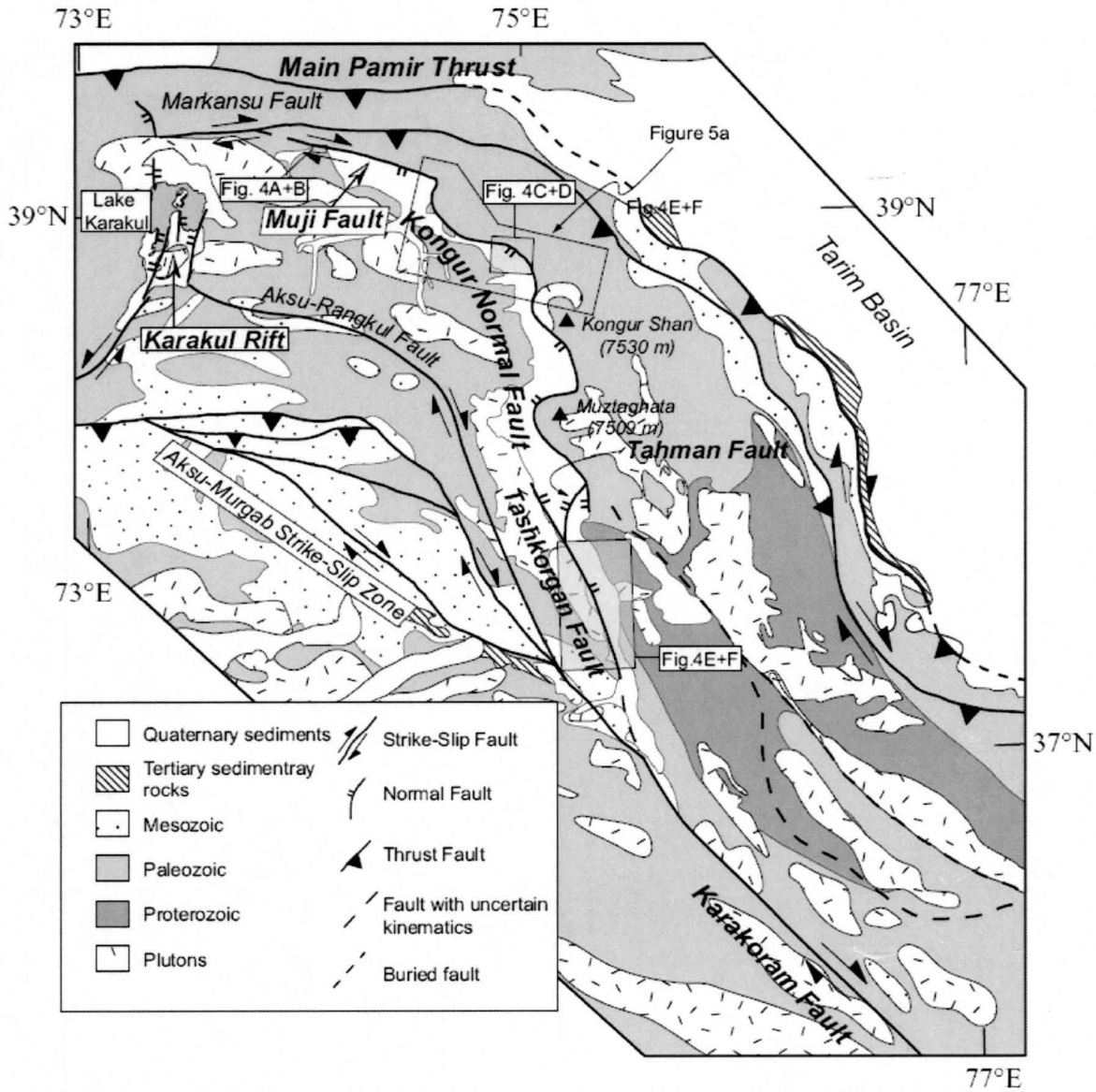


Figure 2. Regional tectonic map including the Karakoram and Main Pamir Thrust faults. Area in Box shows the Muji region. From Robinson et al. 2004.

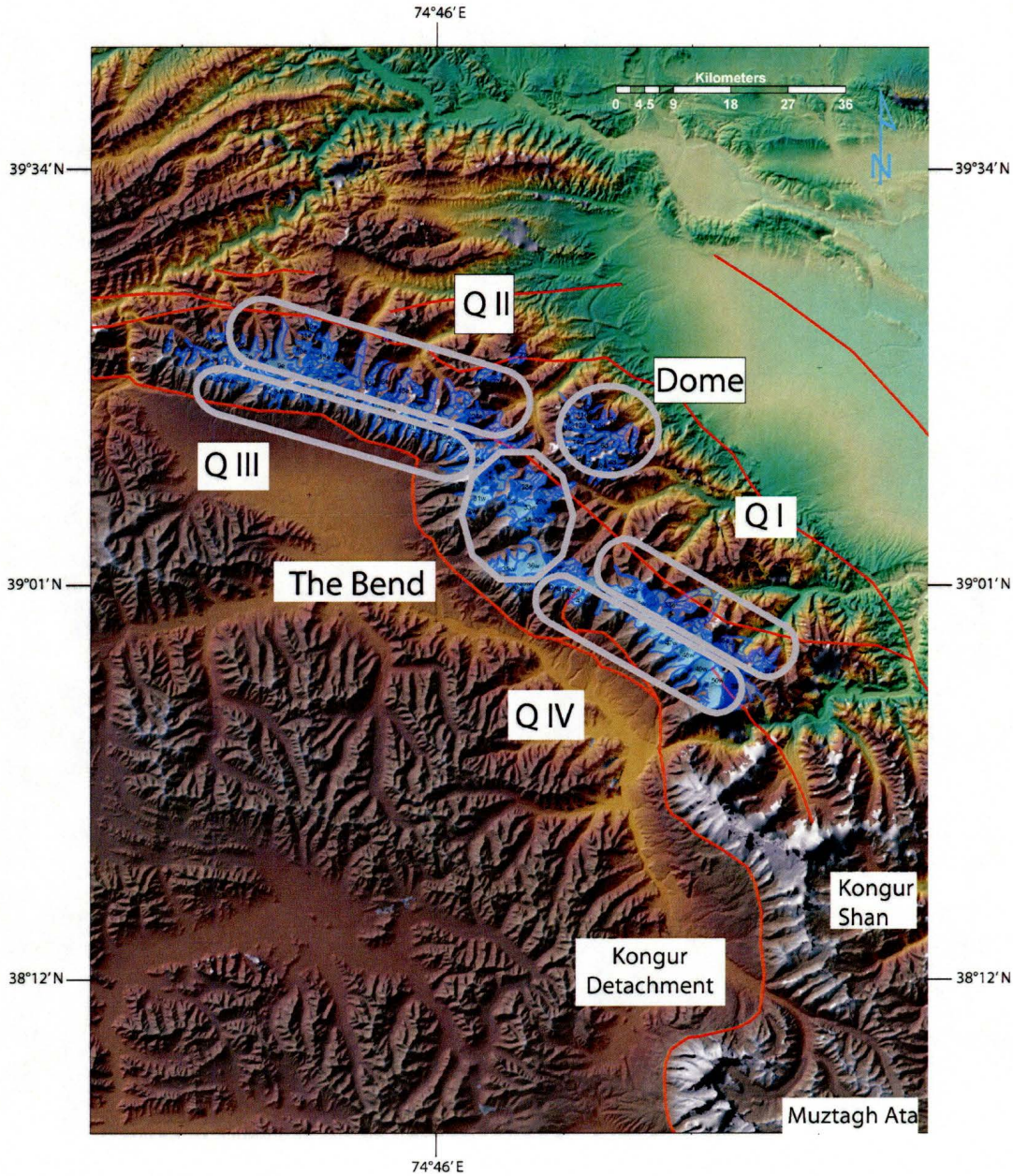
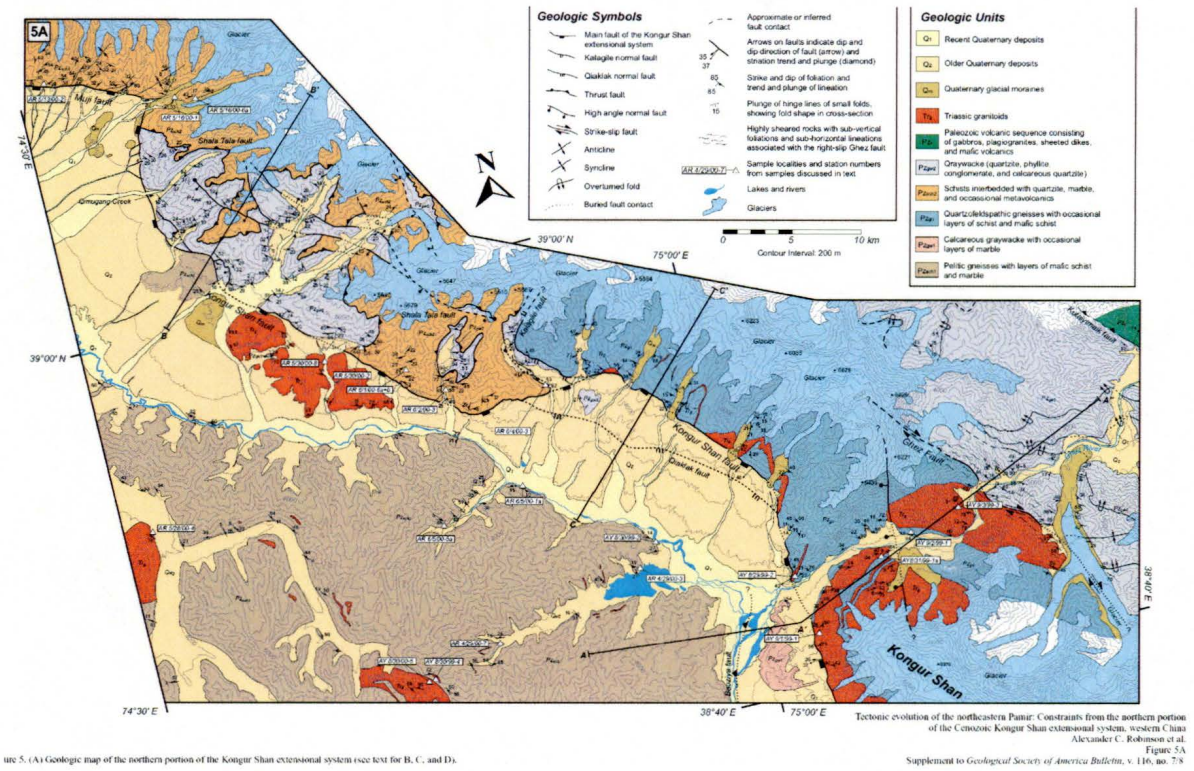


Figure 3. Regional DEM of Muji Region. Displays the location of Quadrants I-IV, the Bend and Dome regions, the high peaks of Kongur Shan and Muztagh Ata massifs, the Kongur Detachment, and other faults (shown in red).



ure 5. (A) Geologic map of the northern portion of the Kongur Shan extensional system (see text for B, C, and D).

Figure 4. Geologic Map of the Muji and Kongur Shan regions. Notable features include the Kongur Shan fault system with minor associated faults and cross section lines corresponding with Figure 5. From Robinson et al. 2004.

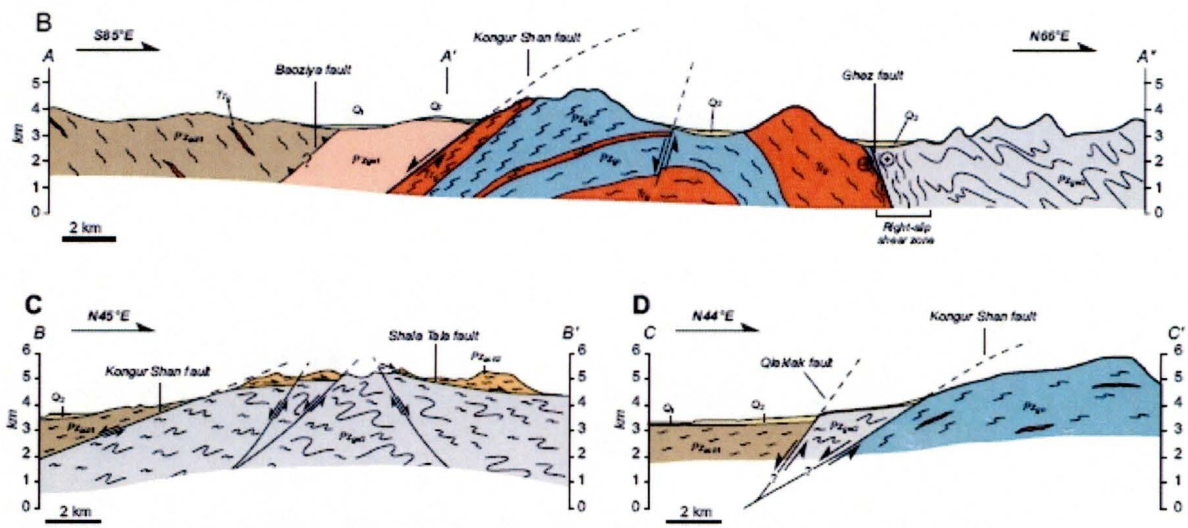


Figure 5. (A) Geologic map of the northern portion of the Kongur Shan extensional system[2]. (B) Geologic cross section along A–A". (C) Geologic cross section along B–B'. (D) Geologic cross section along C–C'.

Figure 5. Geologic cross sections of the Muji and Konugr Shan regions. Figure 4B represents the Kongur Shan massif, 4C represents the Bend region and 4D represents the southern segment of the Muji Range. See section lines on Figure 4. From Robinson et al. 2004.

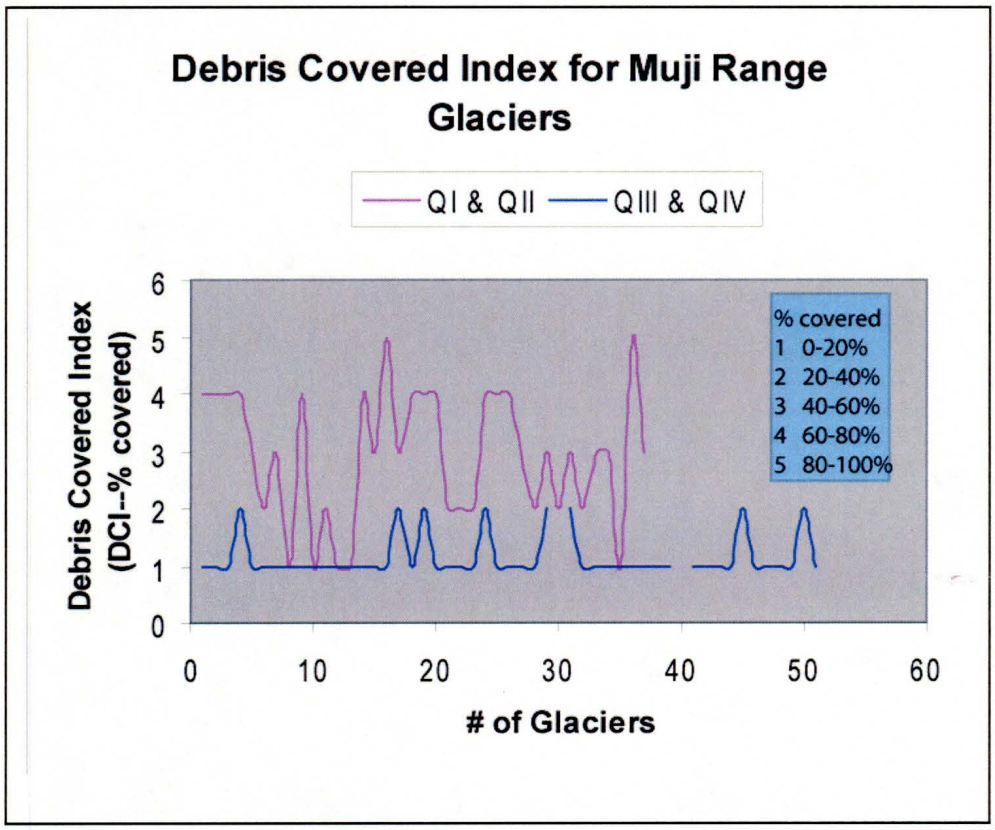


Figure 6. Plot showing the Debris Cover Index for each glacier of the Muji region. QI and QII represent the eastern flank of the Muji Range while QIII and QIV represent the western flank.

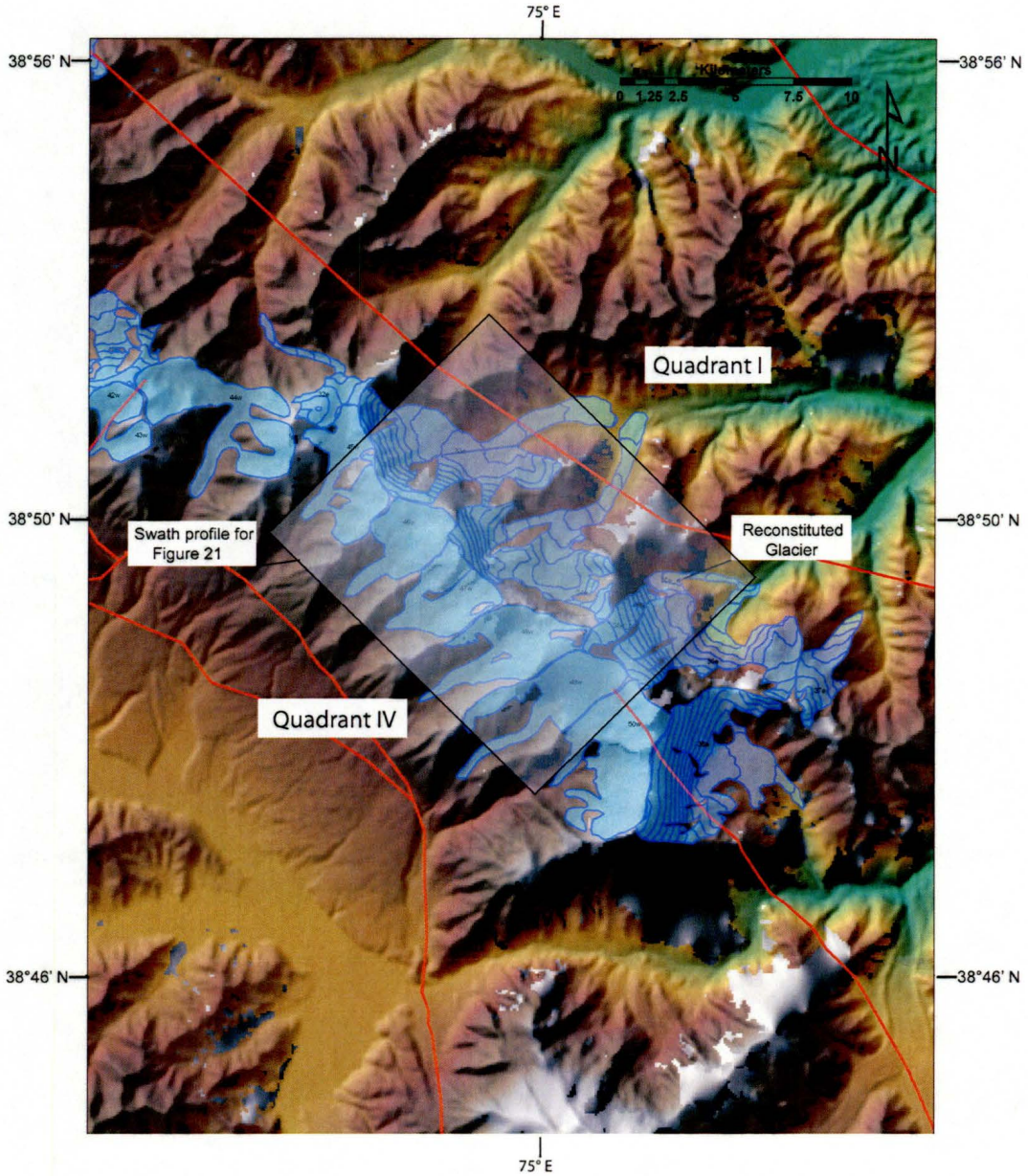


Figure 7. DEM and extent of glaciation in the southern segment (QI and QIV) of the Muji region. Area of swath profile and reconstituted glacier shown.

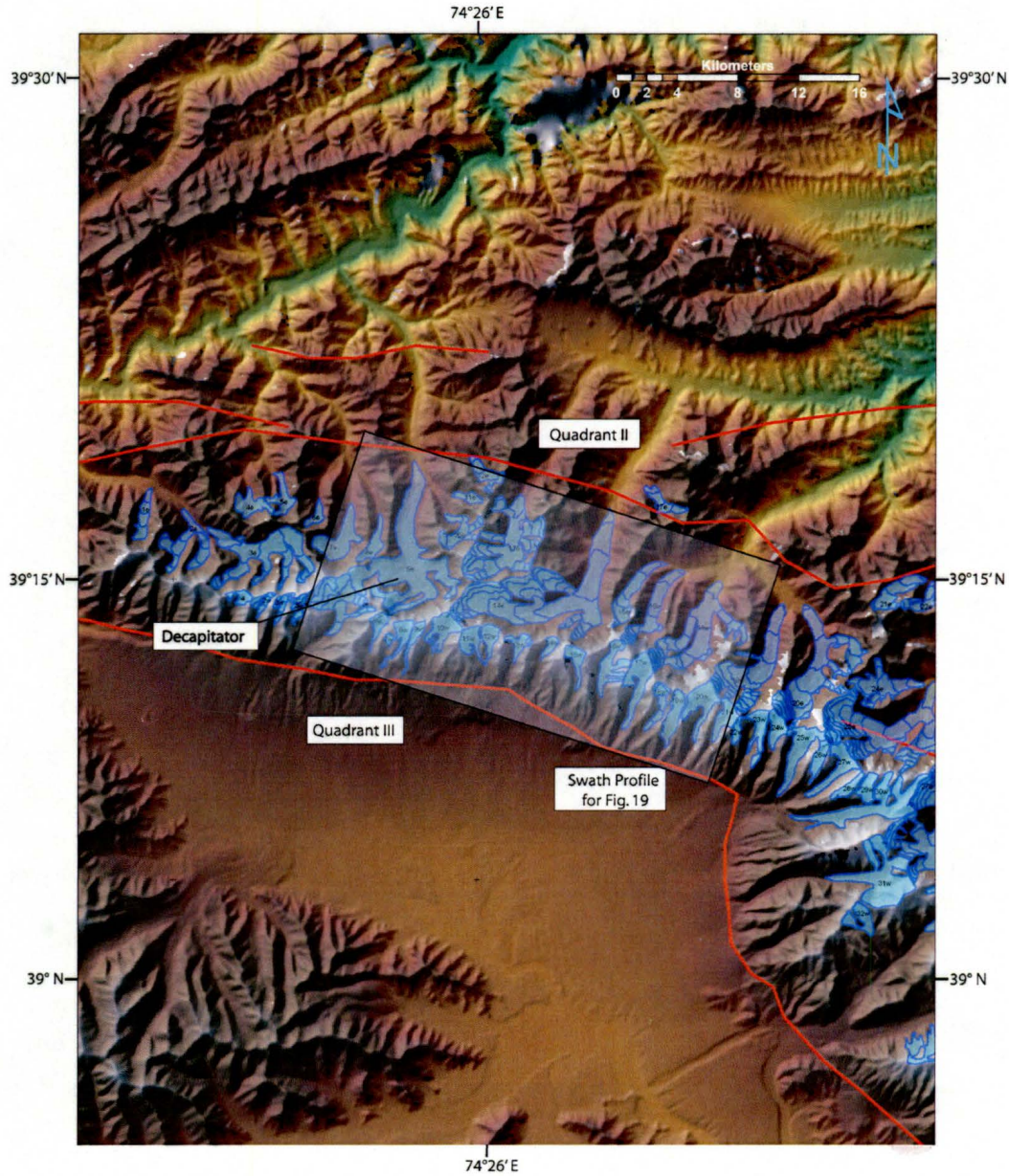


Figure 8. DEM and extent of glaciation of the northern segment (QII and QIII) of the Muji region.

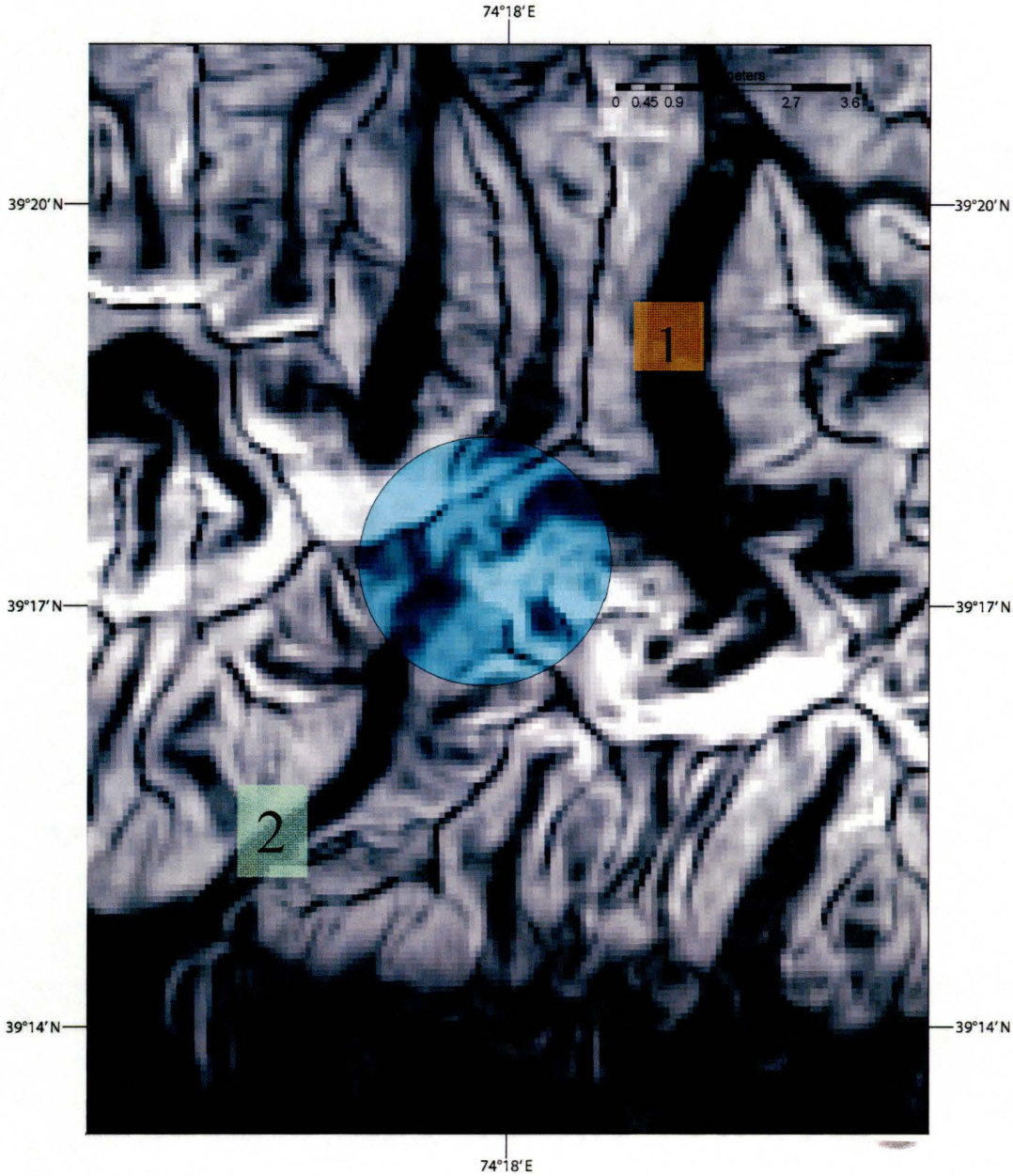


Figure 9. Slope map of "the Decapitator". Blue circle highlights the two glaciers dissecting the Muji range. Notice how the headwall of glacier one has eroded back into the headwall of glacier two.

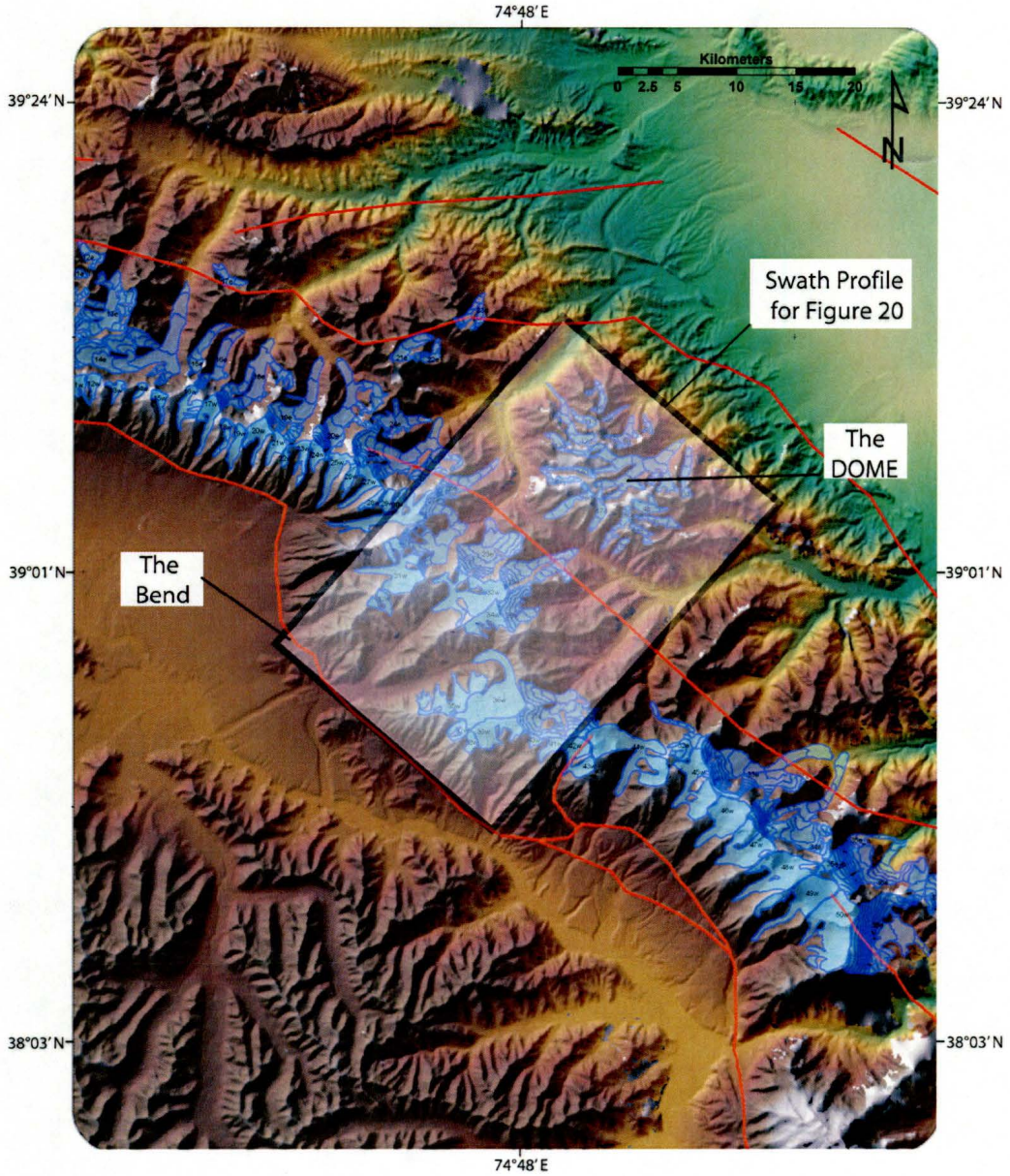


Figure 10. DEM and extent of glaciation of the bend and the dome region. The bend region lies to the west of the pronounced bend in the Kongur detachment. The Dome is the region of radial glaciation in the northeast.

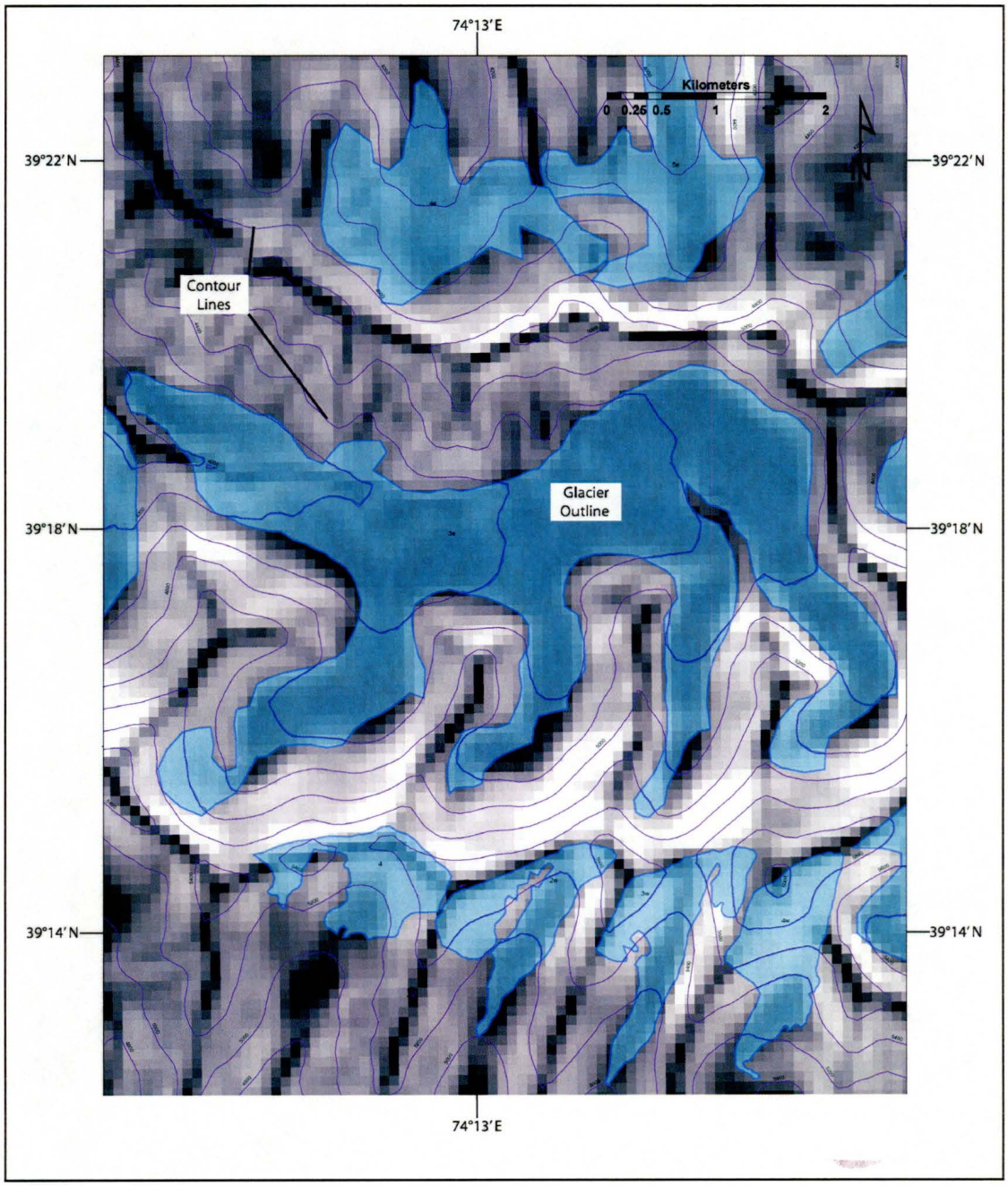


Figure 11. Sample glacier displayed on a slope map with topographic lines. Topographic lines are used to separate the glacier area into polygons of area over the glaciers altitudinal range.

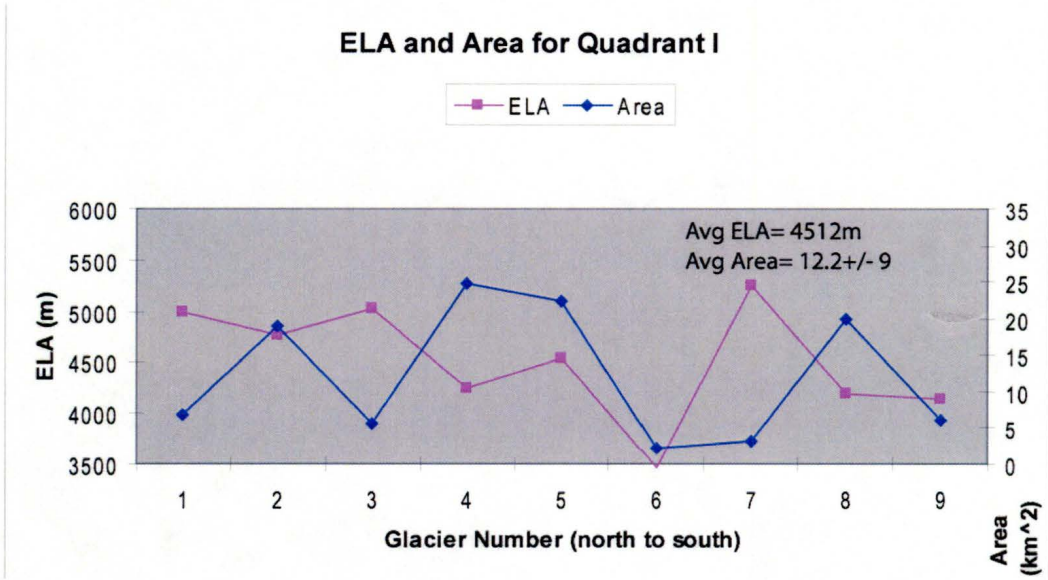


Figure 12. Plot showing ELA and Area for Quadrant I (south-east).

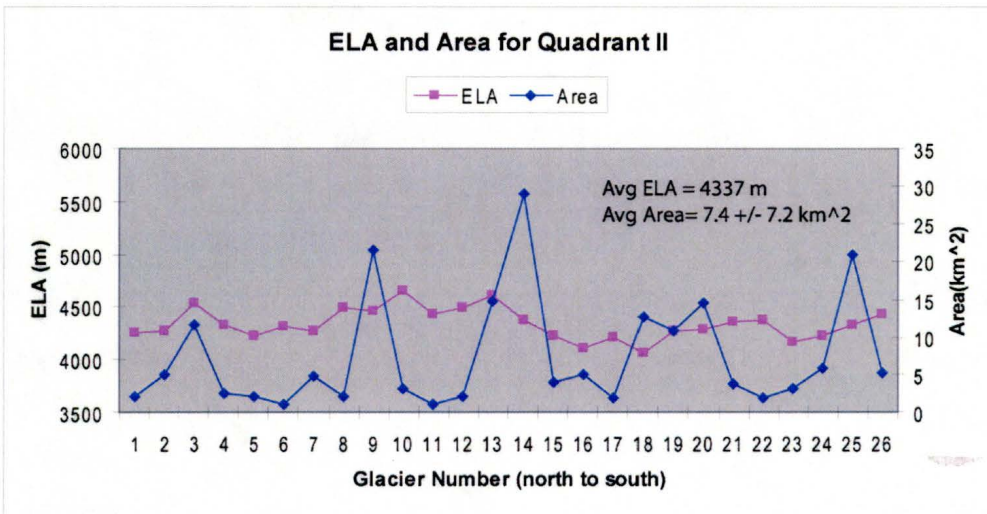


Figure 13. Plot showing ELA and Area for Quadrant II (northeast).

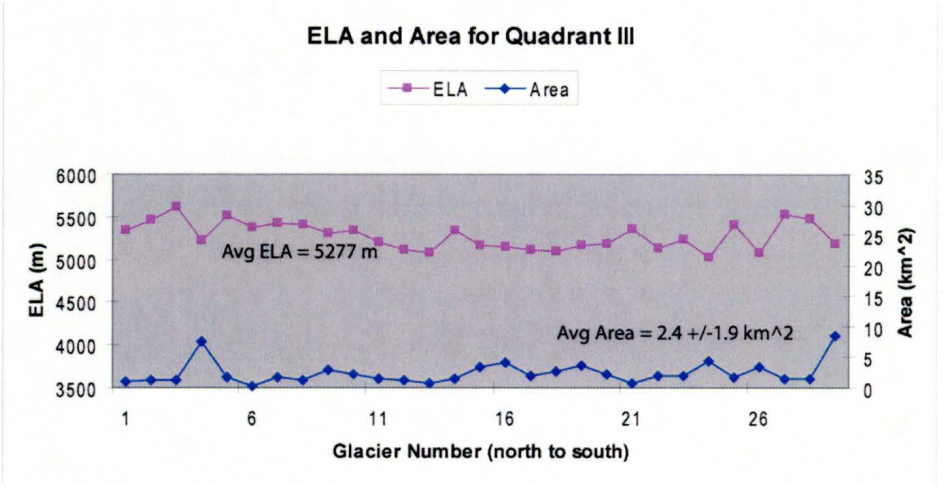


Figure 14. Plot showing ELA and Area for Quadrant III (northwest)

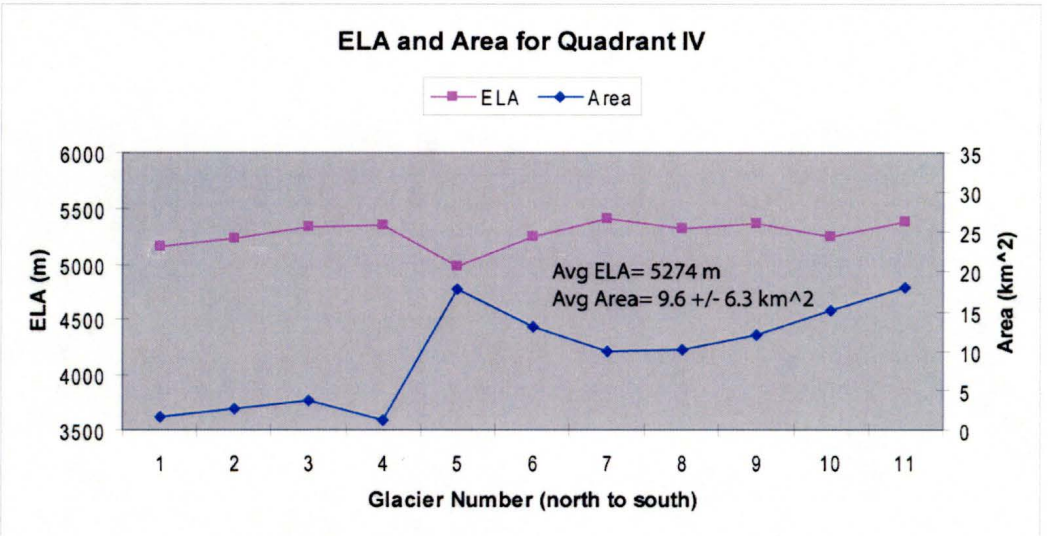


Figure 15. Plot showing ELA and Area for Quadrant IV (southwest)

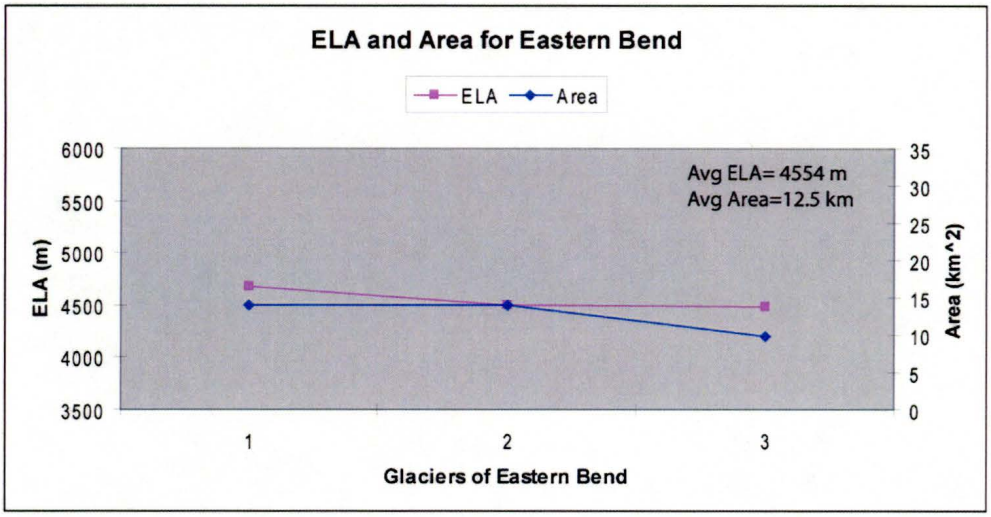


Figure 16. Plot showing ELA and Area for eastern side of the Bend.

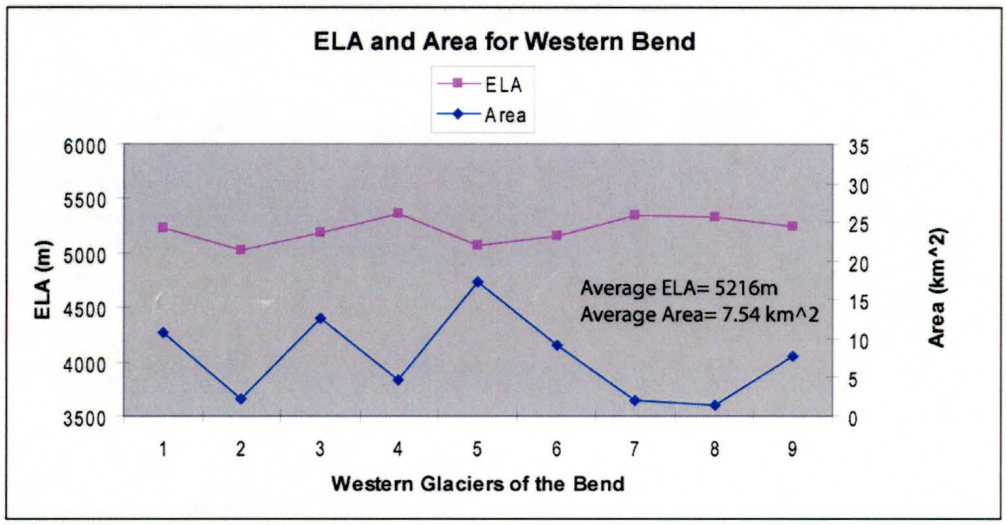


Figure 17. Plot showing ELA and area for western side of the Bend

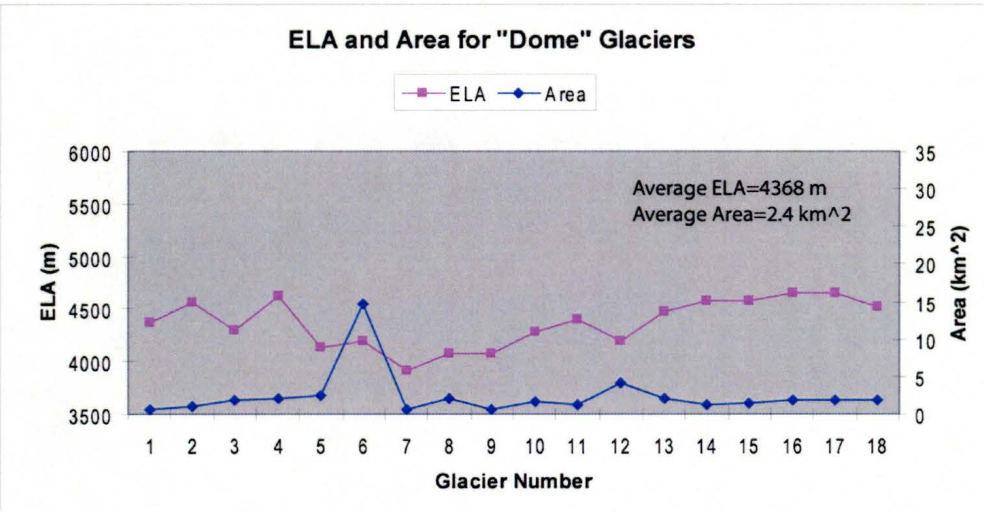


Figure 18. Plot showing ELA and Area for the glaciers of the Dome.

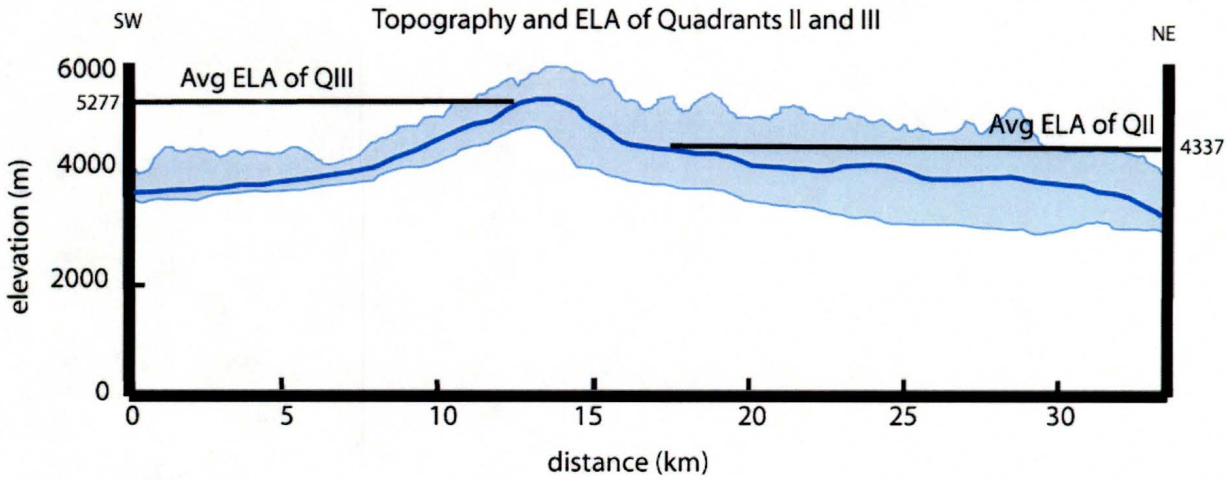


Figure 19. Swath topographic profile of the northern segment of the Muji Region (QII and QIII). Bold line represents mean topography of the swath. Upper envelope of blue shaded region represents average high while lower envelope represents the average low elevation of the swath.

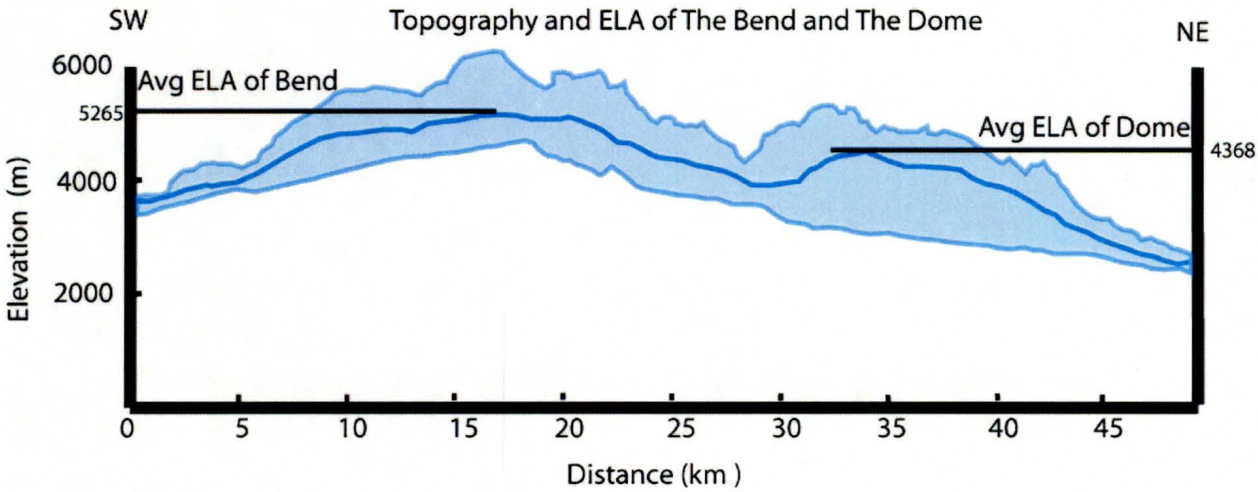


Figure 20. Swath topographic profile of the Bend and Dome region. Bold line represents mean topography of the swath. Upper envelope of blue shaded region represents average high while lower envelope represents the average low elevation of the swath. ELA plotted for comparison with topography.

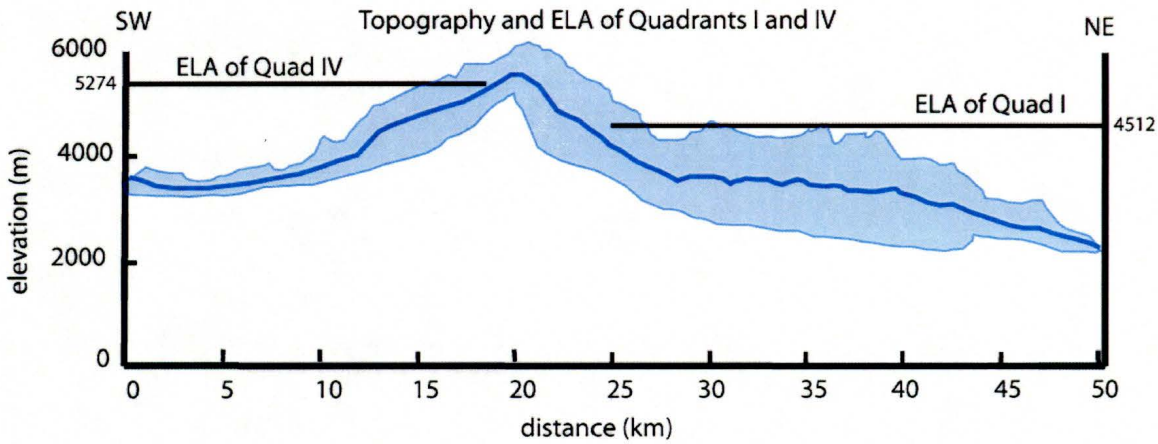


Figure 21. Swath topographic profile of the southern segment of the Muji Region. Bold line represents the mean topography of the swath. Upper envelope of blue shaded region represents average high while lower envelope represents the average low elevation of the swath.

Tables

	QIII	QII	North Avg	North Dif
Valley Spacing	1.3 km	1.9 km	1.6 km	0.6 km
Glacier Area	2.4 km^2	7.4 km^2	4.9 km^2	5 km^2
Debris Cover Index	0-1	2-3	0-3	1-2
ELA	5277 m	4337 m	4807 m	940 m

	Bend windward	Bend downwind	Bend Avg	Bend dif
Valley Spacing	6 km	5 km	5.5 km	.5 km
Glacier Area	7 km^2	12 km^2	9.5 km^2	5 km^2
Debris Cover Index	0-3	0-3	0-4	?
ELA	5216 m	4554 m	4885 m	662 m

	QIV	QI	South Avg	South Dif
Valley Spacing	2.7 km	5.0 km	3.9 km	2.3 km
Glacier Area	9.6 km^2	12 km^2	10.8 km^2	2.4 km^2
Debris Cover Index	1-2	3-5	1-5	2-3
ELA	5274 m	4512 m	4893 m	381 m

	Windward Avg	Downwind Avg	Dome
Valley Spacing	2.0 km	3.5 km	n/a
Glacier Area	6.3 km^2	10.5 km^2	2.4 km^2
Debris Cover Index	0-2	2-5	0-4
ELA	5256 m	4468 m	4368 m

	Windward Dif	Downwind Dif
Valley Spacing	1.4 km	3.1 km
Glacier Area	7.2 km^2	3.1 km^2
Debris Cover Index	1	3
ELA	3 m	175 m

	E:W	N:S
Valley Spacing	1.8 : 1.0	1.0 : 2.4
Glacier Area	1.7 : 1.0	1.0 : 2.2
Debris Cover Index	2-5 : 0-2	0-3 : 1-5
ELA	788 m	86 m

Table 1. East to west and north to south comparison of average values for valley spacing, area, DCI and ELA for each region.

Glacier #	Quadrant I ELA (m)	DCI	Area (km^2)
30e	4987	2	6.691926
31e	4763	3	18.97989
32e	5022	2	5.533659
33e	4238	3	24.75602
34e	4549	3	22.26218
35e_a	3465	1	2.132161
35e_b	5261	5	3.186619
36e	4190	3	19.85354
37e	4136	2	5.998514
Average	4512	2.666667	12.15495

Glacier #	Quadrant II ELA (m)	DCI	km^2
1e	**4251**	4	2.031531
2e	4272	4	4.978461
3e	4536	4	11.68923
4e	4327	4	2.399247
5e	4225	3	2.143131
6e	4319	2	0.980664
7e	4264	3	4.755101
8e	4487	1	1.981535
9e	4456	4	21.52345
10e	4658	1	3.183008
11e	4431	2	0.957863
12e	4498	1	2.119023
13e	4615	1	14.64727
14e	4366	4	28.93527
15e	4232	3	3.943532
16e	4102	5	4.963888
17e	4213	3	1.932203
18e	4064	4	12.7107
19e	4269	4	10.83784
20e	4289	4	14.50399

21e	4358	2	3.630333
22e	4367	2	1.924883
23e	4172	2	3.057996
24e	4228	4	5.764378
25e	4327	4	20.93408
26e	4436	4	5.17254
Average	4337	3.038462	7.373121

Glacier #	Quadrant III ELA (m)	DCI	Area (km^2)
2w	**5348**	1	1.015615
3w	5459	1	1.105591
4w	5610	1	1.131817
5w	5223	2	7.583998
6w	5513	1	1.626498
7w	5370	1	0.351273
8w	5426	1	1.609854
9w	5412	1	1.165077
10w	5300	1	3.01257
11w	5337	1	2.114818
12w	5204	1	1.482485
13w	5117	1	1.188529
14w	5086	1	0.792033
15w	5333	1	1.556646
16w	5164	1	3.357142
17w	5154	1	4.124914
18w	5117	2	1.86199
19w	5100	1	2.706876
20w	5158	2	3.545906
21w	5180	1	2.129355
22w	5355	1	0.734747
23w	5136	1	1.957463
24w	5234	1	1.945887
25w	5020	2	4.343308
26w	5412	1	1.792771
27w	5084	1	3.29763
28w	5529	1	1.443477
29w	5476	1	1.412993
30w	5184	2	8.504005
Average	5277	1.172414	2.375699

Quadrant IV Glacier #	ELA (m)	DCI	Area (km^2)
40w	5153	1	1.69807
41w	5225	1	2.726393
42w	5340	1	3.709856
43w	5355	1	1.309111
44w	4976	2	17.76409
45w	5240	1	13.12651
46w	5407	1	9.88042
47w	5324	1	10.08457
48w	5360	1	12.01252
49w	5248	2	15.19589
50w	5382	1	17.93911
Average	5274	1.181818	9.58605

West Bend Glacier #	ELA (m)	DCI	Area (km^2)
31w	5225	2	10.8496
32w	5032	1	2.189338
33w	5187	1	12.69566
34w	5357	1	4.686559
35w	5065	1	17.27893
36w	5152	1	9.090784
37w	5353	1	1.957305
38w	5331	1	1.421637
39w	5241	1	7.73683
Average	5216	1.111111	7.545183
East Bend			
27e	4672	3	13.95786
28e	4504	2	13.96457
29e	4488	3	9.85726
Average	4554.667	2.666667	12.59323

DOME			
Glacier	ELA (m)	DCI	Area (km^2)
1d	**4366**	1	0.702747
2d	4564	1	1.133425
3d	4302	2	1.84824
4d	4618	1	2.129286
5d	4129	1	2.414257
6d	4188	4	14.75676
7d	3919	1	0.676601
8d	4073	1	2.0934
9d	4080	1	0.594737
10d	4286	2	1.59681
11d	4409	2	1.298203
12d	4200	3	4.047985
13d	4473	1	2.090253
14d	4587	1	1.331504
15d	4582	1	1.459433
16d	4660	3	1.931123
17d	4660	1	1.931123
18d	4526	2	1.95972
Average	4368	1.611111	2.4442

Table 2A-F. Glacier name, ELA, DCI, and Area for all regions.

Appendix A

Quadrant 1

Glacier number or name	Contour vertical interval (VI)	Lowest contour altitude	Mean belt altitude	Contour belt area	Mean altitude x Area	MEDIAN ALT (Sum alts x areas)/ sum areas	Balance Ratio	Reference contour (1)	Belt area x Alt above ref. contour (1)	Area x Alt x Balance Ratio for belt 2
30e	200	4200	4300	134,681.11	579128771.4			2 4200	13468110.96	13468110.96
		4400	4500	697,347.51	3138063798				209204253.2	209204253.2
		4600	4700	1,147,681.03	5394100843				573840515.2	573840515.2
		4800	4900	1,347,031.37	6600453715				942921959.3	942921959.3
		5000	5100	1,534,917.86	7828081101				1381426077	1381426077
		5200	5300	1,230,522.33	6521768341				1353574561	1353574561
		5400	5500	515,834.32	2837088769				670584618.1	670584618.1
		5600	5700	83,910.60	478290445.4				125865906.7	125865906.7
				6691926.138	33376975783	4987.648562			5270886001	5270886001

RESULTS AA ELA (median alt, shortcut method) = 4987
AA ELA (long method, if exact contour) =
AA ELA (long method, if not exact contour) =
ABBR ELA (exact contour ELA) =
AABR ELA (contour plus proportion of belt) =

Glacier number or name	Contour vertical interval (VI)	Lowest contour altitude	Mean belt altitude	Contour belt area	Mean altitude x Area	MEDIAN ALT (Sum alts x areas)/ sum areas	Balance Ratio	Reference contour (1)	Belt area x Alt above ref. contour (1)	Area x Alt x Balance Ratio for belt 2
31e	200	3800	3900	34,143.75	133160630			2 3800	3414375.129	3414375.129
		4000	4100	1,552,689.12	6366025411				465806737.4	465806737.4
		4200	4300	2,409,370.59	10360293531				1204685294	1204685294
		4400	4500	3,185,759.39	14335917239				2230031570	2230031570
		4600	4700	3,046,445.08	14318291898				2741800576	2741800576
		4800	4900	3,017,752.53	14786987412				3319527786	3319527786
		5000	5100	2,603,782.59	13279291186				3384917361	3384917361
		5200	5300	1,963,336.45	10405683164				2945004669	2945004669
		5400	5500	1,136,599.70	6251298353				1932219491	1932219491
		5600	5700	30,011.44	171065202.5				57021734.18	57021734.18
				18979890.64	90408014026	4763.358006			18284429595	18284429595

RESULTS AA ELA (median alt, shortcut method) = 4763
AA ELA (long method, if exact contour) =
AA ELA (long method, if not exact contour) =
ABBR ELA (exact contour ELA) =
AABR ELA (contour plus proportion of belt) =

Glacier number or name	Contour vertical interval (VI)	Lowest contour altitude	Mean belt altitude	Contour belt area	Mean altitude x Area	MEDIAN ALT (Sum alts x areas)/ sum areas	Balance Ratio	Reference contour (1)	Belt area x Alt above ref. contour (1)	Area x Alt x Balance Ratio for belt 2
32e	200	3800	3900	434,022.53	1692687871			2 3800	43402253.11	43402253.11
		4000	4100	302,973.00	1242189301				90891900.1	90891900.1
		4200	4300	208,784.00	897771195.9				104391999.5	104391999.5
		4400	4500	256,286.38	1153288709				179400465.9	179400465.9
		4600	4700	273,458.49	1285254909				246112642.2	246112642.2
		4800	4900	229,894.15	1126481354				252883569.3	252883569.3
		5000	5100	898,202.67	4580833607				1167663469	1167663469
		5200	5300	1,735,106.87	9196066406				2602660304	2602660304
		5400	5500	970,568.84	5338128643				1649967035	1649967035
		5600	5700	208,796.39	1190139427				396713142.2	396713142.2
		5800	5900	15,566.06	91839766.15				32688730.32	32688730.32
				5533659.39	27794681190	5022.83918			6766775510	6766775510

RESULTS AA ELA (median alt, shortcut method) = 5022
AA ELA (long method, if exact contour) =
AA ELA (long method, if not exact contour) =
ABBR ELA (exact contour ELA) =
AABR ELA (contour plus proportion of belt) =

Glacier number or name	Contour vertical interval (VI)	Lowest contour altitude	Mean belt altitude	Contour belt area	Mean altitude x Area	MEDIAN ALT (Sum alts x areas)/ sum areas	Balance Ratio	Reference contour (1)	Belt area x Alt above ref. contour (1)	Area x Alt x Balance Ratio for belt 2
33e	200	3000	3100	39,470.15	122357469.5			2 3000	3947015.145	3947015.145
		3200	3300	2,284,241.79	7537997920				685272538.2	685272538.2
		3400	3500	1,692,596.56	5924087967				846298280.9	846298280.9
		3600	3700	2,169,333.70	8026534675				1518533587	1518533587
		3800	3900	3,815,049.60	14878693427				3433544637	3433544637
		4000	4100	4,651,357.07	19070563998				5116492780	5116492780
		4200	4300	2,559,500.30	11005851284				3327350388	3327350388
		4400	4500	1,192,918.94	5368135242				1789378414	1789378414
		4600	4700	1,071,748.17	5037216386				1821971884	1821971884
		4800	4900	1,166,099.44	5713887251				2215588934	2215588934
		5000	5100	1,020,224.75	5203146231				2142471978	2142471978
		5200	5300	1,141,578.38	6050365391				2625630264	2625630264
		5400	5500	822,391.02	4523150588				2055977540	2055977540
		5600	5700	1,043,627.64	5948677532				2817794621	2817794621
		5800	5900	85,877.74	506678642.1				249045434.3	249045434.3
				24756015.24	1.04917E+11	4238.05459			30649298295	30649298295

RESULTS AA ELA (median alt, shortcut method) = 4238
AA ELA (long method, if exact contour) =
AA ELA (long method, if not exact contour) =
ABBR ELA (exact contour ELA) =
AABR ELA (contour plus proportion of belt) =

Glacier number or name	Contour vertical interval (VI)	Lowest contour altitude	Mean belt altitude	Contour belt area	Mean altitude x Area	MEDIAN ALT (Sum alts x areas)/ sum areas	Balance Ratio	Reference contour (1)	Belt area x Alt above ref. contour (1)	Area x Alt x Balance Ratio for belt 2
34e	200	3000	3100	1,073,222.96	3326991185			2 3000	107322296.3	107322296.3
		3200	3300	1,078,395.95	3558706639				323518785.4	323518785.4
		3400	3500	853,084.13	2985794472				426542067.5	426542067.5
		3600	3700	522,701.04	1933993830				365890724.6	365890724.6
		3800	3900	859,035.38	3350237977				773131840.7	773131840.7
		4000	4100	1,671,934.74	6854932418				1839128210	1839128210
		4200	4300	1,763,213.97	7581820056				2292178157	2292178157
		4400	4500	3,006,525.35	13529364055				4509788018	4509788018
		4600	4700	3,203,642.85	15057121406				5446192849	5446192849
		4800	4900	2,812,914.45	13783280803				5344537454	5344537454
		5000	5100	1,706,730.43	8704325189				3584133901	3584133901
		5200	5300	1,321,318.94	7002990367				3039033556	3039033556
		5400	5500	1,023,029.42	5626661834				2557573561	2557573561
		5600	5700	587,825.06	3350602843				1587127663	1587127663
		5800	5900	557,077.12	3286754979				1615523634	1615523634
		6000	6100	221,532.65	1351349186				686751225.7	686751225.7
				22262184.43	1.01265E+11	4549.64011			34498373943	34498373943

RESULTS AA ELA (median alt, shortcut method) = 4549
AA ELA (long method, if exact contour) =
AA ELA (long method, if not exact contour) =
ABBR ELA (exact contour ELA) =
AABR ELA (contour plus proportion of belt) =

Glacier number or name	Contour vertical interval (VI)	Lowest contour altitude	Mean belt altitude	Contour belt area	Mean altitude x Area	MEDIAN ALT (Sum alts x areas)/ sum areas	Balance Ratio	Reference contour (1)	Belt area x Alt above ref. contour (1)	Area x Alt x Balance Ratio for belt 2
35eA	200	2800	2900	201,502.15	584356246.3			2 2800	20150215.39	20150215.39
		3000	3100	364,840.15	1131004455				109452044.1	109452044.1
		3200	3300	185,765.38	613025767.1				92882691.99	92882691.99
		3400	3500	465,931.29	1630759513				326151902.7	326151902.7
		3600	3700	673,061.33	2490326922				605755197.4	605755197.4
		3800	3900	241,060.61	940136384.2				265166672.5	265166672.5
				2132160.916	7389609289	3465.784047			1419558724	1419558724

RESULTS AA ELA (median alt, shortcut method) = 3465
AA ELA (long method, if exact contour) =
AA ELA (long method, if not exact contour) =
ABBR ELA (exact contour ELA) =
AABR ELA (contour plus proportion of belt) =

Glacier number or name	Contour vertical interval (VI)	Lowest contour altitude	Mean belt altitude	Contour belt area	Mean altitude x Area	MEDIAN ALT (Sum alts x areas)/ sum areas	Balance Ratio	Reference contour (1)	Belt area x Alt above ref. contour (1)	Area x Alt x Balance Ratio for belt 2
35eB	200	3800	3900	58,091.44	226556613.9			2 3800	5809143.947	5809143.947
		4000	4100	148,857.00	610313698.2				44657099.87	44657099.87
		4200	4300	141,914.67	610233083.6				70957335.31	70957335.31
		4400	4500	109,206.98	491431406.9				76444885.51	76444885.51
		4600	4700	144,206.68	677771394.7				129786011.8	129786011.8
		4800	4900	239,285.46	1172498737				263214002.2	263214002.2
		5000	5100	313,052.18	1596566095				406967828.1	406967828.1
		5200	5300	405,395.59	2148596614				608093381.3	608093381.3
		5400	5500	572,825.14	3150538268				973802737.3	973802737.3
		5600	5700	677,596.21	3862298382				1287432794	1287432794
		5800	5900	376,187.90	2219508611				789994590.4	789994590.4
				3186619.235	16766312904	5261.473576			4657159810	4657159810

RESULTS AA ELA (median alt, shortcut method) = 5261
AA ELA (long method, if exact contour) =
AA ELA (long method, if not exact contour) =
ABBR ELA (exact contour ELA) =
AABR ELA (contour plus proportion of belt) =

Glacier number or name	Contour vertical interval (VI)	Lowest contour altitude	Mean belt altitude	Contour belt area	Mean altitude x Area	MEDIAN ALT (Sum alts x areas)/ sum areas	Balance Ratio	Reference contour (1)	Belt area x Alt above ref. contour (1)	Area x Alt x Balance Ratio for belt 2
36e	200	2800	2900	538,770.01	1562433016			2 2800	53877000.55	53877000.55
		3000	3100	903,549.26	2801002712				271064778.6	271064778.6
		3200	3300	674,293.20	2225167571				337146601.7	337146601.7
		3400	3500	1,090,230.48	3815806679				763161335.8	763161335.8
		3600	3700	1,622,294.31	6002488934				1460064876	1460064876
		3800	3900	3,885,051.19	15151699659				4273556314	4273556314
		4000	4100	3,893,782.08	15964506538				5061916707	5061916707
		4200	4300	2,092,968.00	8999762406				3139452002	3139452002
		4400	4500	951,917.45	4283628509				1618259659	1618259659
		4600	4700	666,657.52	3133290327				1266649281	1266649281
		4800	4900	514,741.85	2522235059				1080957883	1080957883
		5000	5100	408,157.81	2081604849				938762971.3	938762971.3
		5200	5300	525,300.76	2784094009				1313251891	1313251891
		5400	5500	708,162.33	3894892832				1912038300	1912038300
		5600	5700	888,671.26	5065426201				2577146664	2577146664
		5800	5900	402,877.57	2376977635				1248920452	1248920452
		6000	6100	86,115.07	525301902.2				284179717.6	284179717.6
				19853540.14	83190318839	4190.200752			27600406434	27600406434

RESULTS AA ELA (median alt, shortcut method) = 4190
AA ELA (long method, if exact contour) =
AA ELA (long method, if not exact contour) =
ABBR ELA (exact contour ELA) =
AABR ELA (contour plus proportion of belt) =

Glacier number or name	Contour vertical interval (VI)	Lowest contour altitude	Mean belt altitude	Contour belt area	Mean altitude x Area	MEDIAN ALT (Sum alts x areas)/ sum areas	Balance Ratio	Reference contour (1)	Belt area x Alt above ref. contour (1)	Area x Alt x Balance Ratio for belt 2
37e	200	3000	3100	12,206.87	37841284.35			2 3000	1220686.592	1220686.592
		3200	3300	238,023.30	785476905				71406991.37	71406991.37
		3400	3500	378,772.50	1325703764				189386252	189386252
		3600	3700	550,662.90	2037452727				385464029.4	385464029.4
		3800	3900	984,921.36	3841193286				886429219.8	886429219.8
		4000	4100	1,247,311.17	5113975780				1372042283	1372042283
		4200	4300	1,035,719.08	4453592037				1346434802	1346434802
		4400	4500	718,823.50	3234705764				1078235255	1078235255
		4600	4700	490,083.08	2303390470				833141233.8	833141233.8
		4800	4900	336,862.99	1650628647				640039679.5	640039679.5
		5000	5100	5,127.12	26148312				10766952	10766952
				5998513.864	24810108976	4136.042616			6814567383	6814567383

RESULTS AA ELA (median alt, shortcut method) = 4136
AA ELA (long method, if exact contour) =
AA ELA (long method, if not exact contour) =
ABBR ELA (exact contour ELA) =
AABR ELA (contour plus proportion of belt) =

Quadrant II

Glacier number or name	Contour vertical interval (VI)	Lowest contour altitude	Mean belt altitude	Contour belt area	Mean altitude x Area	MEDIAN ALT (Sum alts x areas)/ sum areas	Balance Ratio	Reference contour (1)	Belt area x Alt above ref. contour (1)	Area x Alt x Balance Ratio for belt 2
1e	200	3800	3700	18187.49558	67219733.64			2 3800	-1816749.558	-3633499.116
		4000	3900	333690.1823	1301391711				33369018.23	33369018.23
		4200	4100	468561.8	1921103380				140568540	140568540
		4400	4300	536826.4226	2308353617				268413211.3	268413211.3
		4600	4500	655508.7102	2949789196				458856097.2	458856097.2
		4800	4700	18776.16524	88247976.62				16898548.71	16898548.71
				2031530.776	8636105615	4251.033613			916288665.9	914471916.3

RESULTS AA ELA (median alt, shortcut method) = 4251
AA ELA (long method, if exact contour) =
AA ELA (long method, if not exact contour) =
ABBR ELA (exact contour ELA) =
AABR ELA (contour plus proportion of belt) =

Glacier number or name	Contour vertical interval (VI)	Lowest contour altitude	Mean belt altitude	Contour belt area	Mean altitude x Area	MEDIAN ALT (Sum alts x areas)/ sum areas	Balance Ratio	Reference contour (1)	Belt area x Alt above ref. contour (1)	Area x Alt x Balance Ratio for belt 2
2e	200	4000	3900	860531.4412	3356072621			2 4000	-86053144.12	-172106288.2
		4200	4100	998414.8869	4093501036				99841488.69	99841488.69
		4400	4300	1453547.707	6250255140				436064312.1	436064312.1
		4600	4500	1296689.432	5835102443				648344715.9	648344715.9
		4800	4700	369277.998	1735606591				258494598.6	258494598.6
				4978461.465	21270537830	4272.512297			1356691971	1270638827

RESULTS AA ELA (median alt, shortcut method) = 4272
AA ELA (long method, if exact contour) =
AA ELA (long method, if not exact contour) =
ABBR ELA (exact contour ELA) =
AABR ELA (contour plus proportion of belt) =

Glacier number or name	Contour vertical interval (VI)	Lowest contour altitude	Mean belt altitude	Contour belt area	Mean altitude x Area	MEDIAN ALT (Sum alts x areas)/ sum areas	Balance Ratio	Reference contour (1)	Belt area x Alt above ref. contour (1)	Area x Alt x Balance Ratio for belt 2
3e	200	4000	3900	19,228.87	74992582.45			2 4000	-1922886.73	-3845773.459
		4200	4100	1,374,574.94	5635757237				137457493.6	137457493.6
		4400	4300	1,922,395.04	8266298663				576718511.3	576718511.3
		4600	4500	3,558,749.68	16014373569				1779374841	1779374841
		4800	4700	3,121,854.37	14672715555				2185298061	2185298061
		5000	4900	1,336,362.47	6548176094				1202726221	1202726221
		5200	5100	328171.0706	1673672460				360988177.7	360988177.7
		5400	5300	27,897.17	147854978.5				36266315.49	36266315.49
				11689233.6	53033841139	4536.981889			6276906735	6274983848

RESULTS AA ELA (median alt, shortcut method) = 4536
AA ELA (long method, if exact contour) =
AA ELA (long method, if not exact contour) =
ABBR ELA (exact contour ELA) =
AABR ELA (contour plus proportion of belt) =

Glacier number or name	Contour vertical interval (VI)	Lowest contour altitude	Mean belt altitude	Contour belt area	Mean altitude x Area	MEDIAN ALT (Sum alts x areas)/ sum areas	Balance Ratio	Reference contour (1)	Belt area x Alt above ref. contour (1)	Area x Alt x Balance Ratio for belt 2
4e	200	3800	3900	99503.53389	388063782.2			2 3800	9950353.389	9950353.389
		4000	4100	351150.3817	1439716565				105345114.5	105345114.5
		4200	4300	1203396.584	5174605313				601698292.2	601698292.2
		4400	4500	605375.837	2724191266				423763085.9	423763085.9
		4600	4700	139820.7143	657157357.2				125838642.9	125838642.9
				2399247.051	10383734284	4327.913742			1266595489	1266595489

RESULTS AA ELA (median alt, shortcut method) = 4327
AA ELA (long method, if exact contour) =
AA ELA (long method, if not exact contour) =
ABBR ELA (exact contour ELA) =
AABR ELA (contour plus proportion of belt) =

Glacier number or name	Contour vertical interval (VI)	Lowest contour altitude	Mean belt altitude	Contour belt area	Mean altitude x Area	MEDIAN ALT (Sum alts x areas)/ sum areas	Balance Ratio	Reference contour (1)	Belt area x Alt above ref. contour (1)	Area x Alt x Balance Ratio for belt 2
5e	200	3600	3700	27,654.72	102322473			2 3600	2765472.244	2765472.244
		3800	3900	379,570.24	1480323940				113871072.3	113871072.3
		4000	4100	373,234.81	1530262735				186617406.7	186617406.7
		4200	4300	1,003,030.61	4313031619				702121426.4	702121426.4
		4400	4500	297,870.65	1340417939				268083587.8	268083587.8
		4600	4700	61,769.59	290317065.6				67946547.26	67946547.26
				2143130.628	9056675772	4225.909357			1341405513	1341405513

RESULTS AA ELA (median alt, shortcut method) = 4225
AA ELA (long method, if exact contour) =
AA ELA (long method, if not exact contour) =
ABBR ELA (exact contour ELA) =
AABR ELA (contour plus proportion of belt) =

Glacier number or name	Contour vertical interval (VI)	Lowest contour altitude	Mean belt altitude	Contour belt area	Mean altitude x Area	MEDIAN ALT (Sum alts x areas)/ sum areas	Balance Ratio	Reference contour (1)	Belt area x Alt above ref. contour (1)	Area x Alt x Balance Ratio for belt 2
6e	200	4000	4100	247,507.35	1014780140			2 4000	24750735.12	24750735.12
		4200	4300	473,829.89	2037468508				142148965.7	142148965.7
		4400	4500	173,182.11	779319508.9				86591056.54	86591056.54
		4600	4700	86,145.06	404881792.2				60301543.52	60301543.52
				980664.4121	4236449949	4319.979289			313792300.9	313792300.9

RESULTS AA ELA (median alt, shortcut method) = 4319
AA ELA (long method, if exact contour) =
AA ELA (long method, if not exact contour) =
ABBR ELA (exact contour ELA) =
AABR ELA (contour plus proportion of belt) =

Glacier number or name	Contour vertical interval (VI)	Lowest contour altitude	Mean belt altitude	Contour belt area	Mean altitude x Area	MEDIAN ALT (Sum alts x areas)/ sum areas	Balance Ratio	Reference contour (1)	Belt area x Alt above ref. contour (1)	Area x Alt x Balance Ratio for belt 2
7e	200	3800	3900	372,544.42	1452923230			2 3800	37254441.81	37254441.81
		4000	4100	1,368,462.01	5610694225				410538601.8	410538601.8
		4200	4300	1,843,912.54	7928823934				921956271.4	921956271.4
		4400	4500	1,072,584.61	4826630735				750809225.4	750809225.4
		4600	4700	97,597.07	458706209.4				87837359.24	87837359.24
				4755100.641	20277778334	4264.426742			2208395900	2208395900

RESULTS AA ELA (median alt, shortcut method) = 4264
AA ELA (long method, if exact contour) =
AA ELA (long method, if not exact contour) =
ABBR ELA (exact contour ELA) =
AABR ELA (contour plus proportion of belt) =

Glacier number or name	Contour vertical interval (VI)	Lowest contour altitude	Mean belt altitude	Contour belt area	Mean altitude x Area	MEDIAN ALT (Sum alts x areas)/ sum areas	Balance Ratio	Reference contour (1)	Belt area x Alt above ref. contour (1)	Area x Alt x Balance Ratio for belt 2
8e	200	4000	4100	182,415.23	747902459.9			2 4000	18241523.41	18241523.41
		4200	4300	398,266.82	1712547334				119480046.5	119480046.5
		4400	4500	844,007.27	3798032693				422003632.5	422003632.5
		4600	4700	474,924.01	2232142862				332446809.2	332446809.2
		4800	4900	81,921.54	401415555.1				73729387.68	73729387.68
				1981534.876	8892040903	4487.451122			965901399.3	965901399.3

RESULTS AA ELA (median alt, shortcut method) = 4487
AA ELA (long method, if exact contour) =
AA ELA (long method, if not exact contour) =
ABBR ELA (exact contour ELA) =
AABR ELA (contour plus proportion of belt) =

Glacier number or name	Contour vertical interval (VI)	Lowest contour altitude	Mean belt altitude	Contour belt area	Mean altitude x Area	MEDIAN ALT (Sum alts x areas)/ sum areas	Balance Ratio	Reference contour (1)	Belt area x Alt above ref. contour (1)	Area x Alt x Balance Ratio for belt 2
9e	200	3400	3500	211,923.51	741732279			2 3400	21192350.83	21192350.83
		3600	3700	780,961.55	2889557727				234288464.4	234288464.4
		3800	3900	1,977,748.91	7713220754				988874455.7	988874455.7
		4000	4100	3,334,866.60	13672953061				2334406620	2334406620
		4200	4300	4,555,727.41	19589627857				4100154668	4100154668
		4400	4500	3,760,197.30	16920887846				4136217029	4136217029
		4600	4700	2,436,001.60	11449207531				3166802083	3166802083
		4800	4900	1,494,336.79	7322250254				2241505180	2241505180
		5000	5100	1443077.912	7359697352				2453232451	2453232451
		5200	5300	845007.0858	4478537554				1605513463	1605513463
		5400	5500	586698.947	3226844208				1232067789	1232067789
		5600	5700	96,905.05	552358788.4				222881616.4	222881616.4
				21523452.66	95916875212	4456.388886			22737136169	22737136169

RESULTS AA ELA (median alt, shortcut method) = 4456
AA ELA (long method, if exact contour) =
AA ELA (long method, if not exact contour) =
ABBR ELA (exact contour ELA) =
AABR ELA (contour plus proportion of belt) =

Glacier number or name	Contour vertical interval (VI)	Lowest contour altitude	Mean belt altitude	Contour belt area	Mean altitude x Area	MEDIAN ALT (Sum alts x areas)/ sum areas	Balance Ratio	Reference contour (1)	Belt area x Alt above ref. contour (1)	Area x Alt x Balance Ratio for belt 2
10e	200	4000	4100	15,157.77	62146847.49			2 4000	1515776.768	1515776.768
		4200	4300	469,916.30	2020640099				140974890.7	140974890.7
		4400	4500	776,429.50	3493932751				388214750.1	388214750.1
		4600	4700	975,039.13	4582683930				682527393.8	682527393.8
		4800	4900	794,852.91	3894779251				715367617.5	715367617.5
		5000	5100	151,612.14	773221935				166773358.5	166773358.5
				3183007.757	14827404814	4658.299931			2095373787	2095373787

RESULTS AA ELA (median alt, shortcut method) = 4658
AA ELA (long method, if exact contour) =
AA ELA (long method, if not exact contour) =
ABBR ELA (exact contour ELA) =
AABR ELA (contour plus proportion of belt) =

Glacier number or name	Contour vertical interval (VI)	Lowest contour altitude	Mean belt altitude	Contour belt area	Mean altitude x Area	MEDIAN ALT (Sum alts x areas)/ sum areas	Balance Ratio	Reference contour (1)	Belt area x Alt above ref. contour (1)	Area x Alt x Balance Ratio for belt 2
11e	200	4000	4100	33,872.16	138875858.7			2 4000	3387216.066	3387216.066
		4200	4300	311,077.82	1337634619				93323345.52	93323345.52
		4400	4500	563,100.40	2533951781				281550197.9	281550197.9
		4600	4700	49,812.86	234120463.1				34869005.14	34869005.14
				957863.2394	4244582722	4431.303497			413129764.7	413129764.7

RESULTS AA ELA (median alt, shortcut method) = 4431
AA ELA (long method, if exact contour) =
AA ELA (long method, if not exact contour) =
ABBR ELA (exact contour ELA) =
AABR ELA (contour plus proportion of belt) =

Glacier number or name	Contour vertical interval (VI)	Lowest contour altitude	Mean belt altitude	Contour belt area	Mean altitude x Area	MEDIAN ALT (Sum alts x areas)/ sum areas	Balance Ratio	Reference contour (1)	Belt area x Alt above ref. contour (1)	Area x Alt x Balance Ratio for belt 2
12e	200	4000	4100	143,113.05	586763497.9			2 4000	14311304.83	14311304.83
		4200	4300	560,034.70	2408149209				168010409.9	168010409.9
		4400	4500	828,328.50	3727478233				414164248.1	414164248.1
		4600	4700	401,024.37	1884814544				280717059.7	280717059.7
		4800	4900	131,328.51	643509719.9				118195662.8	118195662.8
		5000	5100	55,194.32	281491028.6				60713751.26	60713751.26
				2119023.449	9532206232	4498.395823			1056112437	1056112437

RESULTS AA ELA (median alt, shortcut method) = 4498
AA ELA (long method, if exact contour) =
AA ELA (long method, if not exact contour) =
ABBR ELA (exact contour ELA) =
AABR ELA (contour plus proportion of belt) =

Glacier number or name	Contour vertical interval (VI)	Lowest contour altitude	Mean belt altitude	Contour belt area	Mean altitude x Area	MEDIAN ALT (Sum alts x areas)/ sum areas	Balance Ratio	Reference contour (1)	Belt area x Alt above ref. contour (1)	Area x Alt x Balance Ratio for belt 2
13e	200	4000	4100	896,641.12	3676228587		2	4000	89664111.87	89664111.87
		4200	4300	2,321,824.31	9983844518				696547292	696547292
		4400	4500	4,281,470.78	19266618493				2140735388	2140735388
		4600	4700	3,440,936.53	16172401697				2408655572	2408655572
		4800	4900	2,422,432.29	11869918237				2180189064	2180189064
		5000	5100	817,057.05	4166990962				898762756.4	898762756.4
		5200	5300	466,907.74	2474611045				606980067.8	606980067.8
				14647269.82	67610613540	4615.919169			9021534252	9021534252

RESULTS AA ELA (median alt, shortcut method) = 4615
AA ELA (long method, if exact contour) =
AA ELA (long method, if not exact contour) =
ABBR ELA (exact contour ELA) =
AABR ELA (contour plus proportion of belt) =

Glacier number or name	Contour vertical interval (VI)	Lowest contour altitude	Mean belt altitude	Contour belt area	Mean altitude x Area	MEDIAN ALT (Sum alts x areas)/ sum areas	Balance Ratio	Reference contour (1)	Belt area x Alt above ref. contour (1)	Area x Alt x Balance Ratio for belt 2
14e	200	3400	3500	420,424.50	1471485733		2	3400	42042449.51	42042449.51
		3600	3700	2,132,291.24	7889477588				639687372	639687372
		3800	3900	3,891,186.43	15175627095				1945593217	1945593217
		4000	4100	5,012,577.46	20551567571				3508804219	3508804219
		4200	4300	3,412,676.18	14674507581				3071408563	3071408563
		4400	4500	4,570,063.83	20565287257				5027070218	5027070218
		4600	4700	5,017,450.07	23582015308				6522685085	6522685085
		4800	4900	2,707,830.69	13268370389				4061746038	4061746038
		5000	5100	1275763.304	6506392850				2168797617	2168797617
		5200	5300	277586.564	1471208789				527414471.6	527414471.6
		5400	5500	217420.7943	1195814368				456583667.9	456583667.9
				28935271.06	1.26352E+11	4366.703677			27971832919	27971832919

RESULTS AA ELA (median alt, shortcut method) = 4366
AA ELA (long method, if exact contour) =
AA ELA (long method, if not exact contour) =
ABBR ELA (exact contour ELA) =
AABR ELA (contour plus proportion of belt) =

Glacier number or name	Contour vertical interval (VI)	Lowest contour altitude	Mean belt altitude	Contour belt area	Mean altitude x Area	MEDIAN ALT (Sum alts x areas)/ sum areas	Balance Ratio	Reference contour (1)	Belt area x Alt above ref. contour (1)	Area x Alt x Balance Ratio for belt 2
15e	200	3600	3700	67,582.75	250056180.7		2	3600	6758275.155	6758275.155
		3800	3900	676,367.01	2637831351				202910103.9	202910103.9
		4000	4100	1,308,078.97	5363123796				654039487.3	654039487.3
		4200	4300	572,066.28	2459885008				400446396.6	400446396.6
		4400	4500	1,134,642.54	5105891449				1021178290	1021178290
		4600	4700	161,239.90	757827525.2				177363888.9	177363888.9
		4800	4900	23,554.09	115415025.6				30620312.92	30620312.92
				3943531.55	16690030335	4232.254801			2493316755	2493316755

RESULTS AA ELA (median alt, shortcut method) = 4232
AA ELA (long method, if exact contour) =
AA ELA (long method, if not exact contour) =
ABBR ELA (exact contour ELA) =
AABR ELA (contour plus proportion of belt) =

Glacier number or name	Contour vertical interval (VI)	Lowest contour altitude	Mean belt altitude	Contour belt area	Mean altitude x Area	MEDIAN ALT (Sum alts x areas)/ sum areas	Balance Ratio	Reference contour (1)	Belt area x Alt above ref. contour (1)	Area x Alt x Balance Ratio for belt 2
16e	200	3400	3500	83,871.63	293550721.9			2 3400	8387163.482	8387163.482
		3600	3700	743,875.75	2752340263				223162724	223162724
		3800	3900	1,910,853.42	7452328350				955426711.5	955426711.5
		4000	4100	1,038,925.27	4259593616				727247690.6	727247690.6
		4200	4300	368,469.93	1584420679				331622932.9	331622932.9
		4400	4500	171,327.68	770974558.2				188460447.6	188460447.6
		4600	4700	168,709.04	792932480				219321749.8	219321749.8
		4800	4900	133,788.73	655564767.3				200683092	200683092
		5000	5100	152,666.29	778598060.8				259532686.9	259532686.9
		5200	5300	150,210.18	796113975.3				285399349.6	285399349.6
		5400	5500	41,190.29	226546574.6				86499601.2	86499601.2
				4963888.205	20362964047	4102.220519			3485744150	3485744150

RESULTS AA ELA (median alt, shortcut method) = 4102
AA ELA (long method, if exact contour) =
AA ELA (long method, if not exact contour) =
ABBR ELA (exact contour ELA) =
AABR ELA (contour plus proportion of belt) =

Glacier number or name	Contour vertical interval (VI)	Lowest contour altitude	Mean belt altitude	Contour belt area	Mean altitude x Area	MEDIAN ALT (Sum alts x areas)/ sum areas	Balance Ratio	Reference contour (1)	Belt area x Alt above ref. contour (1)	Area x Alt x Balance Ratio for belt 2
17e	200	3800	3900	360,140.18	1404546692			2 3800	36014017.74	36014017.74
		4000	4100	572,004.66	2345219092				171601396.9	171601396.9
		4200	4300	564,929.99	2429198956				282464994.9	282464994.9
		4400	4500	414,634.76	1865856440				290244335	290244335
		4600	4700	20,493.51	96319514.11				18444162.28	18444162.28
				1932203.102	8141140693	4213.398005			798768906.9	798768906.9

RESULTS AA ELA (median alt, shortcut method) = 4213
AA ELA (long method, if exact contour) =
AA ELA (long method, if not exact contour) =
ABBR ELA (exact contour ELA) =
AABR ELA (contour plus proportion of belt) =

Glacier number or name	Contour vertical interval (VI)	Lowest contour altitude	Mean belt altitude	Contour belt area	Mean altitude x Area	MEDIAN ALT (Sum alts x areas)/ sum areas	Balance Ratio	Reference contour (1)	Belt area x Alt above ref. contour (1)	Area x Alt x Balance Ratio for belt 2
18e	200	3400	3500	659,582.92	2308540232			2 3400	65958292.34	65958292.34
		3600	3700	2,775,352.22	10268803201				832605664.9	832605664.9
		3800	3900	3,515,292.57	13709641037				1757646287	1757646287
		4000	4100	2,091,568.98	8575432837				1464098289	1464098289
		4200	4300	1,371,717.65	5898385914				1234545889	1234545889
		4400	4500	1,122,680.05	5052060224				1234948055	1234948055
		4600	4700	354,117.87	1664353968				460353224.6	460353224.6
		4800	4900	284,442.14	1393766488				426663210.6	426663210.6
		5000	5100	266,755.81	1360454644				453484881.4	453484881.4
		5200	5300	269,188.39	1426698459				511457938.3	511457938.3
				12710698.61	51658137003	4064.146165			8441761732	8441761732

RESULTS AA ELA (median alt, shortcut method) = 4064
AA ELA (long method, if exact contour) =
AA ELA (long method, if not exact contour) =
ABBR ELA (exact contour ELA) =
AABR ELA (contour plus proportion of belt) =

Glacier number or name	Contour vertical interval (VI)	Lowest contour altitude	Mean belt altitude	Contour belt area	Mean altitude x Area	MEDIAN ALT (Sum alts x areas)/ sum areas	Balance Ratio	Reference contour (1)	Belt area x Alt above ref. contour (1)	Area x Alt x Balance Ratio for belt 2
19e	200	3400	3500	52,576.57	184017980			2 3400	5257656.57	5257656.57
		3600	3700	1,372,442.35	5078036713				411732706.5	411732706.5
		3800	3900	1,783,392.14	6955229340				891696069.3	891696069.3
		4000	4100	2,195,444.92	9001324166				1536811443	1536811443
		4200	4300	1,902,341.06	8180066561				1712106955	1712106955
		4400	4500	1,295,404.64	5829320896				1424945108	1424945108
		4600	4700	907,911.18	4267182527				1180284529	1180284529
		4800	4900	535,566.99	2624278273				803350491.6	803350491.6
		5000	5100	319,047.59	1627142718				542380905.9	542380905.9
		5200	5300	416,008.33	2204844164				790415832.4	790415832.4
		5400	5500	57,699.56	317347559.9				121169068.3	121169068.3
				10837835.33	46268790898	4269.191169			9420150765	9420150765

RESULTS
AA ELA (median alt, shortcut method) = 4269
AA ELA (long method, if exact contour) =
AA ELA (long method, if not exact contour) =
ABBR ELA (exact contour ELA) =
AABR ELA (contour plus proportion of belt) =

Glacier number or name	Contour vertical interval (VI)	Lowest contour altitude	Mean belt altitude	Contour belt area	Mean altitude x Area	MEDIAN ALT (Sum alts x areas)/ sum areas	Balance Ratio	Reference contour (1)	Belt area x Alt above ref. contour (1)	Area x Alt x Balance Ratio for belt 2
20e	200	3400	3500	108,843.27	380951429.5			2 3400	10884326.56	10884326.56
		3600	3700	1,550,860.64	5738184385				465258193.4	465258193.4
		3800	3900	2,114,630.48	8247058878				1057315241	1057315241
		4000	4100	3,075,638.79	12610119037				2152947153	2152947153
		4200	4300	2,944,611.74	12661830489				2650150568	2650150568
		4400	4500	2,039,953.61	9179791240				2243948970	2243948970
		4600	4700	744,664.94	3499925215				968064421.2	968064421.2
		4800	4900	557,684.44	2732653755				836526659.8	836526659.8
		5000	5100	652,754.88	3329049864				1109683288	1109683288
		5200	5300	467,768.80	2479174626				888760715.1	888760715.1
		5400	5500	227,490.67	1251198687				477730407.8	477730407.8
		5600	5700	19,085.84	108789288.4				43897432.17	43897432.17
				14503988.09	62218726896	4289.766821			12905167375	12905167375

RESULTS AA ELA (median alt, shortcut method) = 4289
AA ELA (long method, if exact contour) =
AA ELA (long method, if not exact contour) =
ABBR ELA (exact contour ELA) =
AABR ELA (contour plus proportion of belt) =

Glacier number or name	Contour vertical interval (VI)	Lowest contour altitude	Mean belt altitude	Contour belt area	Mean altitude x Area	MEDIAN ALT (Sum alts x areas)/ sum areas	Balance Ratio	Reference contour (1)	Belt area x Alt above ref. contour (1)	Area x Alt x Balance Ratio for belt 2
21e	200	3800	3900	83,058.93	323929818.4			2 3800	8305892.78	8305892.78
		4000	4100	809,495.03	3318929632				242848509.6	242848509.6
		4200	4300	1,107,360.85	4761651652				553680424.6	553680424.6
		4400	4500	1,279,570.04	5758065172				895699026.7	895699026.7
		4600	4700	297,385.39	1397711316				267646847.8	267646847.8
		4800	4900	53,462.31	261965299.8				58808536.68	58808536.68
				3630332.54	15822252890	4358.34809			2026989238	2026989238

RESULTS AA ELA (median alt, shortcut method) = 4358
AA ELA (long method, if exact contour) =
AA ELA (long method, if not exact contour) =
ABBR ELA (exact contour ELA) =
AABR ELA (contour plus proportion of belt) =

Glacier number or name	Contour vertical interval (VI)	Lowest contour altitude	Mean belt altitude	Contour belt area	Mean altitude x Area	MEDIAN ALT (Sum alts x areas)/ sum areas	Balance Ratio	Reference contour (1)	Belt area x Alt above ref. contour (1)	Area x Alt x Balance Ratio for belt 2
22e	200	3800	3900	98,818.80	385393311.8		2	3800	9881879.79	9881879.79
		4000	4100	444,493.99	1822425371				133348197.9	133348197.9
		4200	4300	540,890.71	2325830039				270445353.4	270445353.4
		4400	4500	488,665.17	2198993250				342065616.7	342065616.7
		4600	4700	251,875.63	1183815455				226688065.8	226688065.8
		4800	4900	100,138.24	490677394.8				110152068.2	110152068.2
				1924882.537	8407134822	4367.609275			1092581182	1092581182

RESULTS AA ELA (median alt, shortcut method) = 4367
AA ELA (long method, if exact contour) =
AA ELA (long method, if not exact contour) =
ABBR ELA (exact contour ELA) =
AABR ELA (contour plus proportion of belt) =

Glacier number or name	Contour vertical interval (VI)	Lowest contour altitude	Mean belt altitude	Contour belt area	Mean altitude x Area	MEDIAN ALT (Sum alts x areas)/ sum areas	Balance Ratio	Reference contour (1)	Belt area x Alt above ref. contour (1)	Area x Alt x Balance Ratio for belt 2
23e	200	3400	3500	115,483.74	404193079.1		2	3400	11548373.69	11548373.69
		3600	3700	349,649.25	1293702215				104894774.2	104894774.2
		3800	3900	487,341.60	1900632230				243670798.7	243670798.7
		4000	4100	565,078.68	2316822582				395555075.1	395555075.1
		4200	4300	793,099.31	3410327053				713789383.2	713789383.2
		4400	4500	392,151.26	1764680669				431366385.9	431366385.9
		4600	4700	351,165.24	1650476642				456514815.9	456514815.9
		4800	4900	4,026.57	19730207.51				6039859.443	6039859.443
				3057995.651	12760564679	4172.852462			2363379466	2363379466

RESULTS AA ELA (median alt, shortcut method) = 4172
AA ELA (long method, if exact contour) =
AA ELA (long method, if not exact contour) =
ABBR ELA (exact contour ELA) =
AABR ELA (contour plus proportion of belt) =

Glacier number or name	Contour vertical interval (VI)	Lowest contour altitude	Mean belt altitude	Contour belt area	Mean altitude x Area	MEDIAN ALT (Sum alts x areas)/ sum areas	Balance Ratio	Reference contour (1)	Belt area x Alt above ref. contour (1)	Area x Alt x Balance Ratio for belt 2
24e	200	3400	3500	3,088.40	10809408.27		2	3400	308840.2364	308840.2364
		3600	3700	422,126.27	1561867188				126637880.1	126637880.1
		3800	3900	786,503.94	3067365385				393251972.5	393251972.5
		4000	4100	1,251,213.18	5129974046				875849227.4	875849227.4
		4200	4300	1,889,856.77	8126384108				1700871092	1700871092
		4400	4500	1,007,212.82	4532457683				1107934100	1107934100
		4600	4700	220,387.36	1035820594				286503568.5	286503568.5
		4800	4900	132,001.77	646808666.9				198002653.1	198002653.1
		5000	5100	51,987.91	265138321.2				88379440.4	88379440.4
				5764378.419	24376625401	4228.838502			4777738775	4777738775

RESULTS AA ELA (median alt, shortcut method) = 4228
AA ELA (long method, if exact contour) =
AA ELA (long method, if not exact contour) =
ABBR ELA (exact contour ELA) =
AABR ELA (contour plus proportion of belt) =

Glacier number or name	Contour vertical interval (VI)	Lowest contour altitude	Mean belt altitude	Contour belt area	Mean altitude x Area	MEDIAN ALT (Sum alts x areas)/ sum areas	Balance Ratio	Reference contour (1)	Belt area x Alt above ref. contour (1)	Area x Alt x Balance Ratio for belt 2
25e	200	3400	3500	1,144,735.54	4006574406			2 3400	114473554.5	114473554.5
		3600	3700	1,815,241.65	6716394118				544572496.1	544572496.1
		3800	3900	2,624,489.45	10235508866				1312244726	1312244726
		4000	4100	4,038,135.79	16556356737				2826695053	2826695053
		4200	4300	2,840,730.32	12215140388				2556657290	2556657290
		4400	4500	2,586,100.06	11637450264				2844710065	2844710065
		4600	4700	2,186,666.03	10277330339				2842665838	2842665838
		4800	4900	1,592,154.47	7801556926				2388231712	2388231712
		5000	5100	931,559.74	4750954697				1583651566	1583651566
		5200	5300	532,578.07	2822663777				1011898335	1011898335
		5400	5500	411,924.70	2265585854				865041871.5	865041871.5
		5600	5700	204,212.36	1164010466				469688433.7	469688433.7
		5800	5900	25,554.41	150770993.2				63886014.05	63886014.05
				20934082.61	90600297831	4327.884795			19424416955	19424416955

RESULTS AA ELA (median alt, shortcut method) = 4327
AA ELA (long method, if exact contour) =
AA ELA (long method, if not exact contour) =
ABBR ELA (exact contour ELA) =
AABR ELA (contour plus proportion of belt) =

Glacier number or name	Contour vertical interval (VI)	Lowest contour altitude	Mean belt altitude	Contour belt area	Mean altitude x Area	MEDIAN ALT (Sum alts x areas)/ sum areas	Balance Ratio	Reference contour (1)	Belt area x Alt above ref. contour (1)	Area x Alt x Balance Ratio for belt 2
26e	200	3400	3500	17,300.69	60552415.65			2 3400	1730069.019	1730069.019
		3600	3700	363,219.26	1343911277				108965779.2	108965779.2
		3800	3900	586,094.65	2285769122				293047323.3	293047323.3
		4000	4100	640,379.33	2625555257				448265531.6	448265531.6
		4200	4300	801,502.32	3446459995				721352091.9	721352091.9
		4400	4500	974,968.83	4387359720				1072465709	1072465709
		4600	4700	679,567.01	3193964930				883437108.4	883437108.4
		4800	4900	488,830.30	2395268470				733245449.9	733245449.9
		5000	5100	445,475.69	2271926030				757308676.5	757308676.5
		5200	5300	135,616.04	718765015.9				257670477.4	257670477.4
		5400	5500	39,585.88	217722344.7				83130349.81	83130349.81
				5172540.003	22947254576	4436.360968			5360618566	5360618566

RESULTS AA ELA (median alt, shortcut method) = 4436
AA ELA (long method, if exact contour) =
AA ELA (long method, if not exact contour) =
ABBR ELA (exact contour ELA) =
AABR ELA (contour plus proportion of belt) =

Glacier number or name	Contour vertical interval (VI)	Lowest contour altitude	Mean belt altitude	Contour belt area	Mean altitude x Area	MEDIAN ALT (Sum alts x areas)/ sum areas	Balance Ratio	Reference contour (1)	Belt area x Alt above ref. contour (1)	Area x Alt x Balance Ratio for belt 2
27e	200	3800	3900	22,269.20	86849881.24			2 3800	2226920.032	2226920.032
		4000	4100	888,830.38	3644204538				266649112.5	266649112.5
		4200	4300	2,685,603.36	11548094447				1342801680	1342801680
		4400	4500	3,971,098.65	17869943924				2779769055	2779769055
		4600	4700	1,883,538.70	8852631893				1695184831	1695184831
		4800	4900	1,315,180.70	6444385429				1446698770	1446698770
		5000	5100	1,376,779.07	7021573271				1789812795	1789812795
		5200	5300	1,188,141.05	6297147578				1782211579	1782211579
		5400	5500	584,987.38	3217430610				994478552.2	994478552.2
		5600	5700	41,436.40	236187506.8				78729168.92	78729168.92
				13957864.9	65218449079	4672.523309			12178562462	12178562462

RESULTS AA ELA (median alt, shortcut method) = 4672
AA ELA (long method, if exact contour) =
AA ELA (long method, if not exact contour) =
ABBR ELA (exact contour ELA) =
AABR ELA (contour plus proportion of belt) =

Glacier number or name	Contour vertical interval (VI)	Lowest contour altitude	Mean belt altitude	Contour belt area	Mean altitude x Area	MEDIAN ALT (Sum alts x areas)/ sum areas	Balance Ratio	Reference contour (1)	Belt area x Alt above ref. contour (1)	Area x Alt x Balance Ratio for belt 2
28e	200	3600	3700	46,619.31	172491448.7			2 3600	4661931.047	4661931.047
		3800	3900	790,724.90	3083827113				237217470.3	237217470.3
		4000	4100	1,836,787.17	7530827415				918393587.2	918393587.2
		4200	4300	3,019,270.20	12982861850				2113489138	2113489138
		4400	4500	3,500,452.12	15752034546				3150406909	3150406909
		4600	4700	1,888,912.83	8877890284				2077804109	2077804109
		4800	4900	1,553,917.44	7614195478				2020092678	2020092678
		5000	5100	769,957.00	3926780704				1154935501	1154935501
		5200	5300	501,374.63	2657285548				852336874	852336874
		5400	5500	56,558.55	311072012.6				107461240.7	107461240.7
				13964574.16	62909266401	4504.918353			12636799439	12636799439

RESULTS AA ELA (median alt, shortcut method) = 4504
AA ELA (long method, if exact contour) =
AA ELA (long method, if not exact contour) =
ABBR ELA (exact contour ELA) =
AABR ELA (contour plus proportion of belt) =

Glacier number or name	Contour vertical interval (VI)	Lowest contour altitude	Mean belt altitude	Contour belt area	Mean altitude x Area	MEDIAN ALT (Sum alts x areas)/ sum areas	Balance Ratio	Reference contour (1)	Belt area x Alt above ref. contour (1)	Area x Alt x Balance Ratio for belt 2
29e	200	3600	3700	221,767.92	820541308.4			2 3600	22176792.12	22176792.12
		3800	3900	1,102,981.63	4301628366				330894489.7	330894489.7
		4000	4100	1,570,803.03	6440292430				785401515.8	785401515.8
		4200	4300	1,275,715.41	5485576270				893000788.1	893000788.1
		4400	4500	1,946,894.43	8760124928				1752024986	1752024986
		4600	4700	1,607,862.79	7556955126				1768649072	1768649072
		4800	4900	838,275.71	4107550957				1089758417	1089758417
		5000	5100	672,231.13	3428378739				1008346688	1008346688
		5200	5300	344,831.98	1827609499				586214367.7	586214367.7
		5400	5500	276,095.48	1518525117				524581403.9	524581403.9
				9857259.505	44247182739	4488.791506			8761048520	8761048520

RESULTS AA ELA (median alt, shortcut method) = 4488
AA ELA (long method, if exact contour) =
AA ELA (long method, if not exact contour) =
ABBR ELA (exact contour ELA) =
AABR ELA (contour plus proportion of belt) =

Quadrant III

Glacier number or name	Contour vertical interval (VI)	Lowest contour altitude	Mean belt altitude	Contour belt area	Mean altitude x Area	MEDIAN ALT (Sum alts x areas)/ sum areas	Balance Ratio	Reference contour (1)	Belt area x Alt above ref. contour (1)	Area x Alt x Balance Ratio for belt 2
2w	200	5000	5100	221,938.83	1131888009			2 5000	22193882.53	22193882.53
		5200	5300	360,112.64	1908596980				108033791.3	108033791.3
		5400	5500	397,262.42	2184943329				198631211.7	198631211.7
		5600	5700	36,301.13	206916456.6				25410792.92	25410792.92
				1015615.019	5432344774	5348.822804			354269678.5	354269678.5

RESULTS AA ELA (median alt, shortcut method) = 5348
AA ELA (long method, if exact contour) =
AA ELA (long method, if not exact contour) =
ABBR ELA (exact contour ELA) =
AABR ELA (contour plus proportion of belt) =

Glacier number or name	Contour vertical interval (VI)	Lowest contour altitude	Mean belt altitude	Contour belt area	Mean altitude x Area	MEDIAN ALT (Sum alts x areas)/ sum areas	Balance Ratio	Reference contour (1)	Belt area x Alt above ref. contour (1)	Area x Alt x Balance Ratio for belt 2
3w	200	5000	5100	188,651.51	962122688.1			2 5000	18865150.75	18865150.75
		5200	5300	248,194.56	1315431155				74458367.28	74458367.28
		5400	5500	345,833.83	1902086039				172916912.6	172916912.6
		5600	5700	243,693.23	1389051397				170585259.2	170585259.2
		5800	5900	79,217.78	467384883.2				71295999.13	71295999.13
				1105590.895	6036076162	5459.592867			508121689	508121689

RESULTS AA ELA (median alt, shortcut method) = 5459
AA ELA (long method, if exact contour) =
AA ELA (long method, if not exact contour) =
ABBR ELA (exact contour ELA) =
AABR ELA (contour plus proportion of belt) =

Glacier number or name	Contour vertical interval (VI)	Lowest contour altitude	Mean belt altitude	Contour belt area	Mean altitude x Area	MEDIAN ALT (Sum alts x areas)/ sum areas	Balance Ratio	Reference contour (1)	Belt area x Alt above ref. contour (1)	Area x Alt x Balance Ratio for belt 2
4w	200	5000	5100	59,523.33	303568970.5			2 5000	5952332.755	5952332.755
		5200	5300	255,054.81	1351790468				76516441.59	76516441.59
		5400	5500	178,305.12	980678186.6				89152562.42	89152562.42
		5600	5700	308,790.53	1760106021				216153371	216153371
		5800	5900	297,910.25	1757670473				268119224.8	268119224.8
		6000	6100	32,233.33	196623338.1				35456667.52	35456667.52
				1131817.372	6350437458	5610.832293			691350600.1	691350600.1

RESULTS AA ELA (median alt, shortcut method) = 5610
AA ELA (long method, if exact contour) =
AA ELA (long method, if not exact contour) =
ABBR ELA (exact contour ELA) =
AABR ELA (contour plus proportion of belt) =

Glacier number or name	Contour vertical interval (VI)	Lowest contour altitude	Mean belt altitude	Contour belt area	Mean altitude x Area	MEDIAN ALT (Sum alts x areas)/ sum areas	Balance Ratio	Reference contour (1)	Belt area x Alt above ref. contour (1)	Area x Alt x Balance Ratio for belt 2
5w	200	4600	4700	479,721.14	2254689339			2 4600	47972113.6	47972113.6
		4800	4900	981,863.66	4811131937				294559098.2	294559098.2
		5000	5100	1,955,559.75	9973354722				977779874.7	977779874.7
		5200	5300	2,225,566.54	11795502688				1557896581	1557896581
		5400	5500	1,483,548.63	8159517445				1335193764	1335193764
		5600	5700	409,422.45	2333707950				450364692.2	450364692.2
		5800	5900	48,315.86	285063564				62810615.8	62810615.8
				7583998.023	39612967646	5223.230218			4726576740	4726576740

RESULTS AA ELA (median alt, shortcut method) = 5223
AA ELA (long method, if exact contour) =
AA ELA (long method, if not exact contour) =
ABBR ELA (exact contour ELA) =
AABR ELA (contour plus proportion of belt) =

Glacier number or name	Contour vertical interval (VI)	Lowest contour altitude	Mean belt altitude	Contour belt area	Mean altitude x Area	MEDIAN ALT (Sum alts x areas)/ sum areas	Balance Ratio	Reference contour (1)	Belt area x Alt above ref. contour (1)	Area x Alt x Balance Ratio for belt 2
6w	200	4800	4900	52,824.87	258841842.3			2 4800	5282486.577	5282486.577
		5000	5100	236,521.16	1206257897				70956346.86	70956346.86
		5200	5300	302,869.95	1605210717				151434973.3	151434973.3
		5400	5500	241,435.72	1327896471				169005005.4	169005005.4
		5600	5700	396,423.14	2259611888				356780824.4	356780824.4
		5800	5900	396,423.14	2338896516				436065452.1	436065452.1
				1626497.967	8996715330	5531.34127			1189525089	1189525089

RESULTS AA ELA (median alt, shortcut method) = 5531
AA ELA (long method, if exact contour) =
AA ELA (long method, if not exact contour) =
ABBR ELA (exact contour ELA) =
AABR ELA (contour plus proportion of belt) =

Glacier number or name	Contour vertical interval (VI)	Lowest contour altitude	Mean belt altitude	Contour belt area	Mean altitude x Area	MEDIAN ALT (Sum alts x areas)/ sum areas	Balance Ratio	Reference contour (1)	Belt area x Alt above ref. contour (1)	Area x Alt x Balance Ratio for belt 2
7w	200	5200	5100	30,664.90	156391014.1			2 5200	-3066490.472	-6132980.944
		5400	5300	165,384.63	876538533.7				16538462.9	16538462.9
		5600	5500	155,223.51	853729310.6				46567053.31	46567053.31
				351273.0447	1886658858	5370.918397			60039025.74	56972535.26

RESULTS AA ELA (median alt, shortcut method) = 5370
AA ELA (long method, if exact contour) =
AA ELA (long method, if not exact contour) =
ABBR ELA (exact contour ELA) =
AABR ELA (contour plus proportion of belt) =

Glacier number or name	Contour vertical interval (VI)	Lowest contour altitude	Mean belt altitude	Contour belt area	Mean altitude x Area	MEDIAN ALT (Sum alts x areas)/ sum areas	Balance Ratio	Reference contour (1)	Belt area x Alt above ref. contour (1)	Area x Alt x Balance Ratio for belt 2
8w	200	4400	4500	9,187.24	41342565.97			2 4400	918723.6882	918723.6882
		4600	4700	116,203.20	546155061.8				34860961.39	34860961.39
		4800	4900	90,850.29	445166415.9				45425144.48	45425144.48
		5000	5100	137,052.85	698969538.4				95936995.47	95936995.47
		5200	5300	184,405.76	977350528.2				165965184	165965184
		5400	5500	465,012.07	2557566394				511513278.8	511513278.8
		5600	5700	560,391.40	3194230979				728508819.7	728508819.7
		5800	5900	46,751.61	275834512				70127418.3	70127418.3
				1609854.425	8736615995	5426.960264			1653256526	1653256526

RESULTS AA ELA (median alt, shortcut method) = 5426
AA ELA (long method, if exact contour) =
AA ELA (long method, if not exact contour) =
ABBR ELA (exact contour ELA) =
AABR ELA (contour plus proportion of belt) =

Glacier number or name	Contour vertical interval (VI)	Lowest contour altitude	Mean belt altitude	Contour belt area	Mean altitude x Area	MEDIAN ALT (Sum alts x areas)/ sum areas	Balance Ratio	Reference contour (1)	Belt area x Alt above ref. contour (1)	Area x Alt x Balance Ratio for belt 2
9w	200	4600	4700	78,433.80	368638863.9			2 4600	7843380.084	7843380.084
		4800	4900	93,452.03	457914935.6				28035608.3	28035608.3
		5000	5100	121,979.85	622097250.8				60989926.55	60989926.55
		5200	5300	143,390.66	759970494.7				100373461.6	100373461.6
		5400	5500	315,779.20	1736785599				284201279.9	284201279.9
		5600	5700	352,935.51	2011732422				388229063.8	388229063.8
		5800	5900	59,105.68	348723517.4				76837385.19	76837385.19
				1165078.734	6305863083	5412.401516			946510105.4	946510105.4

RESULTS AA ELA (median alt, shortcut method) = 5412
AA ELA (long method, if exact contour) =
AA ELA (long method, if not exact contour) =
ABBR ELA (exact contour ELA) =
AABR ELA (contour plus proportion of belt) =

Glacier number or name	Contour vertical interval (VI)	Lowest contour altitude	Mean belt altitude	Contour belt area	Mean altitude x Area	MEDIAN ALT (Sum alts x areas)/ sum areas	Balance Ratio	Reference contour (1)	Belt area x Alt above ref. contour (1)	Area x Alt x Balance Ratio for belt 2
10w	200	4800	4900	460,577.19	2256828232			2 4800	46057719.01	46057719.01
		5000	5100	656,366.85	3347470925				196910054.4	196910054.4
		5200	5300	783,735.11	4153796096				391867556.2	391867556.2
		5400	5500	632,823.00	3480526504				442976100.6	442976100.6
		5600	5700	479,067.65	2730685620				431160887.4	431160887.4
				3012569.804	15969307377	5300.892067			1508972318	1508972318

RESULTS AA ELA (median alt, shortcut method) = 5300
AA ELA (long method, if exact contour) =
AA ELA (long method, if not exact contour) =
ABBR ELA (exact contour ELA) =
AABR ELA (contour plus proportion of belt) =

Glacier number or name	Contour vertical interval (VI)	Lowest contour altitude	Mean belt altitude	Contour belt area	Mean altitude x Area	MEDIAN ALT (Sum alts x areas)/ sum areas	Balance Ratio	Reference contour (1)	Belt area x Alt above ref. contour (1)	Area x Alt x Balance Ratio for belt 2
11w	200	4600	4700	19,675.79	92476221.13			2 4600	1967579.173	1967579.173
		4800	4900	189,192.78	927044634.1				56757834.74	56757834.74
		5000	5100	393,534.93	2007028139				196767464.6	196767464.6
		5200	5300	618,395.42	3277495741				432876796	432876796
		5400	5500	558,024.32	3069133737				502221884.2	502221884.2
		5600	5700	335,994.67	1915169613				369594135.8	369594135.8
				2114817.911	11288348085	5337.739966			1560185695	1560185695

RESULTS AA ELA (median alt, shortcut method) = 5337
AA ELA (long method, if exact contour) =
AA ELA (long method, if not exact contour) =
ABBR ELA (exact contour ELA) =
AABR ELA (contour plus proportion of belt) =

Glacier number or name	Contour vertical interval (VI)	Lowest contour altitude	Mean belt altitude	Contour belt area	Mean altitude x Area	MEDIAN ALT (Sum alts x areas)/ sum areas	Balance Ratio	Reference contour (1)	Belt area x Alt above ref. contour (1)	Area x Alt x Balance Ratio for belt 2
12w	200	4600	4700	13,324.70	62626106.26			2 4600	1332470.346	1332470.346
		4800	4900	117,187.85	574220454.2				35156354.34	35156354.34
		5000	5100	568,999.52	2901897532				284499758	284499758
		5200	5300	646,674.35	3427374074				452672047.4	452672047.4
		5400	5500	136,298.51	749641812.1				122668660.2	122668660.2
				1482484.932	7715759978	5204.612749			896329290.3	896329290.3

RESULTS AA ELA (median alt, shortcut method) = 5204
AA ELA (long method, if exact contour) =
AA ELA (long method, if not exact contour) =
ABBR ELA (exact contour ELA) =
AABR ELA (contour plus proportion of belt) =

Glacier number or name	Contour vertical interval (VI)	Lowest contour altitude	Mean belt altitude	Contour belt area	Mean altitude x Area	MEDIAN ALT (Sum alts x areas)/ sum areas	Balance Ratio	Reference contour (1)	Belt area x Alt above ref. contour (1)	Area x Alt x Balance Ratio for belt 2
13w	200	4800	4900	322,858.17	1582005026			2 4800	32285816.86	32285816.86
		5000	5100	539,194.94	2749894171				161758480.6	161758480.6
		5200	5300	228,824.11	1212767771				114412053.9	114412053.9
		5400	5500	97,651.41	537082748.2				68355986.14	68355986.14
				1188528.621	6081749716	5117.04103			376812337.5	376812337.5

RESULTS AA ELA (median alt, shortcut method) = 5117
AA ELA (long method, if exact contour) =
AA ELA (long method, if not exact contour) =
ABBR ELA (exact contour ELA) =
AABR ELA (contour plus proportion of belt) =

Glacier number or name	Contour vertical interval (VI)	Lowest contour altitude	Mean belt altitude	Contour belt area	Mean altitude x Area	MEDIAN ALT (Sum alts x areas)/ sum areas	Balance Ratio	Reference contour (1)	Belt area x Alt above ref. contour (1)	Area x Alt x Balance Ratio for belt 2
14w	200	4800	4900	252,966.15	1239534150			2 4800	25296615.32	25296615.32
		5000	5100	339,183.31	1729834870				101754992.4	101754992.4
		5200	5300	199,883.66	1059383384				99941828.72	99941828.72
				792033.1185	4028752405	5086.59589			226993436.4	226993436.4

RESULTS AA ELA (median alt, shortcut method) = 5086
AA ELA (long method, if exact contour) =
AA ELA (long method, if not exact contour) =
ABBR ELA (exact contour ELA) =
AABR ELA (contour plus proportion of belt) =

Glacier number or name	Contour vertical interval (VI)	Lowest contour altitude	Mean belt altitude	Contour belt area	Mean altitude x Area	MEDIAN ALT (Sum alts x areas)/ sum areas	Balance Ratio	Reference contour (1)	Belt area x Alt above ref. contour (1)	Area x Alt x Balance Ratio for belt 2
15w	200	4800	4900	174,716.64	856111551.9			2 4800	17471664.32	17471664.32
		5000	5100	299,739.08	1528669317				89921724.52	89921724.52
		5200	5300	373,146.99	1977679036				186573494	186573494
		5400	5500	506,304.29	2784673584				354413001.6	354413001.6
		5600	5700	202,738.64	1155610220				182464771.5	182464771.5
				1556645.636	8302743708	5333.740395			830844655.9	830844655.9

RESULTS AA ELA (median alt, shortcut method) = 5333
AA ELA (long method, if exact contour) =
AA ELA (long method, if not exact contour) =
ABBR ELA (exact contour ELA) =
AABR ELA (contour plus proportion of belt) =

Glacier number or name	Contour vertical interval (VI)	Lowest contour altitude	Mean belt altitude	Contour belt area	Mean altitude x Area	MEDIAN ALT (Sum alts x areas)/ sum areas	Balance Ratio	Reference contour (1)	Belt area x Alt above ref. contour (1)	Area x Alt x Balance Ratio for belt 2
16w	200	4600	4700	225,782.00	1061175395			2 4600	22578199.89	22578199.89
		4800	4900	940,398.00	4607950184				282119399	282119399
		5000	5100	924,975.16	4717373339				462487582.3	462487582.3
		5200	5300	514,011.68	2724261930				359808179.4	359808179.4
		5400	5500	393,623.31	2164928201				354260978.4	354260978.4
		5600	5700	256,998.20	1464889733				282698018.6	282698018.6
		5800	5900	101,354.04	597988828				131760250.2	131760250.2
				3357142.392	17338567610	5164.68043			1895712608	1895712608

RESULTS AA ELA (median alt, shortcut method) = 5164
AA ELA (long method, if exact contour) =
AA ELA (long method, if not exact contour) =
ABBR ELA (exact contour ELA) =
AABR ELA (contour plus proportion of belt) =

Glacier number or name	Contour vertical interval (VI)	Lowest contour altitude	Mean belt altitude	Contour belt area	Mean altitude x Area	MEDIAN ALT (Sum alts x areas)/ sum areas	Balance Ratio	Reference contour (1)	Belt area x Alt above ref. contour (1)	Area x Alt x Balance Ratio for belt 2
17w	200	4200	4300	49,750.02	213925104.5			2 4200	4975002.431	4975002.431
		4400	4500	443,483.19	1995674344				133044956.2	133044956.2
		4600	4700	386,393.41	1816049036				193196706	193196706
		4800	4900	406,825.06	1993442781				284777540.1	284777540.1
		5000	5100	714,427.65	3643581035				642984888.4	642984888.4
		5200	5300	880,240.74	4665275899				968264809.2	968264809.2
		5400	5500	836,797.48	4602386160				1087836729	1087836729
		5600	5700	352,073.76	2006820409				528110633.9	528110633.9
		5800	5900	54,922.35	324041887.9				93368001.59	93368001.59
				4124913.664	21261196655	5154.337372			3936559267	3936559267

RESULTS AA ELA (median alt, shortcut method) = 5154
AA ELA (long method, if exact contour) =
AA ELA (long method, if not exact contour) =
ABBR ELA (exact contour ELA) =
AABR ELA (contour plus proportion of belt) =

Glacier number or name	Contour vertical interval (VI)	Lowest contour altitude	Mean belt altitude	Contour belt area	Mean altitude x Area	MEDIAN ALT (Sum alts x areas)/ sum areas	Balance Ratio	Reference contour (1)	Belt area x Alt above ref. contour (1)	Area x Alt x Balance Ratio for belt 2
18w	200	4600	4700	232,798.85	1094154574			2 4600	23279884.56	23279884.56
		4800	4900	388,050.00	1901444991				116414999.5	116414999.5
		5000	5100	472,899.35	2411786681				236449674.6	236449674.6
		5200	5300	520,050.34	2756266800				364035237.8	364035237.8
		5400	5500	248,191.85	1365055169				223372663.9	223372663.9
				1861990.381	9528708215	5117.485198			963552460.3	963552460.3

RESULTS AA ELA (median alt, shortcut method) = 5117
AA ELA (long method, if exact contour) =
AA ELA (long method, if not exact contour) =
ABBR ELA (exact contour ELA) =
AABR ELA (contour plus proportion of belt) =

Glacier number or name	Contour vertical interval (VI)	Lowest contour altitude	Mean belt altitude	Contour belt area	Mean altitude x Area	MEDIAN ALT (Sum alts x areas)/ sum areas	Balance Ratio	Reference contour (1)	Belt area x Alt above ref. contour (1)	Area x Alt x Balance Ratio for belt 2
19w	200	4200	4300	6,137.67	26391999.02			2 4200	613767.419	613767.419
		4400	4500	123,905.57	557575081.2				37171672.08	37171672.08
		4600	4700	271,822.60	1277566223				135911300.3	135911300.3
		4800	4900	503,334.40	2466338556				352334079.5	352334079.5
		5000	5100	638,050.35	3254056782				574245314.4	574245314.4
		5200	5300	883,801.64	4684148707				972181807.1	972181807.1
		5400	5500	279,823.91	1539031508				363771083.6	363771083.6
				2706876.15	13805108856	5100.014958			2436229024	2436229024

RESULTS AA ELA (median alt, shortcut method) = 5100
AA ELA (long method, if exact contour) =
AA ELA (long method, if not exact contour) =
ABBR ELA (exact contour ELA) =
AABR ELA (contour plus proportion of belt) =

Glacier number or name	Contour vertical interval (VI)	Lowest contour altitude	Mean belt altitude	Contour belt area	Mean altitude x Area	MEDIAN ALT (Sum alts x areas)/ sum areas	Balance Ratio	Reference contour (1)	Belt area x Alt above ref. contour (1)	Area x Alt x Balance Ratio for belt 2
20w	200	4400	4500	198,474.05	893133230.8			2 4400	19847405.13	19847405.13
		4600	4700	321,823.45	1512570215				96547035.03	96547035.03
		4800	4900	358,709.70	1757677541				179354851.1	179354851.1
		5000	5100	547,163.70	2790534868				383014589.8	383014589.8
		5200	5300	1,606,998.21	8517090505				1446298388	1446298388
		5400	5500	512,737.08	2820053935				564010787.1	564010787.1
				3545906.191	18291060296	5158.359898			2689073056	2689073056

RESULTS AA ELA (median alt, shortcut method) = 5158
AA ELA (long method, if exact contour) =
AA ELA (long method, if not exact contour) =
ABBR ELA (exact contour ELA) =
AABR ELA (contour plus proportion of belt) =

Glacier number or name	Contour vertical interval (VI)	Lowest contour altitude	Mean belt altitude	Contour belt area	Mean altitude x Area	MEDIAN ALT (Sum alts x areas)/ sum areas	Balance Ratio	Reference contour (1)	Belt area x Alt above ref. contour (1)	Area x Alt x Balance Ratio for belt 2
21w	200	4600	4700	120,867.56	568077509.4			2 4600	12086755.52	12086755.52
		4800	4900	408,293.65	2000638870				122488094.1	122488094.1
		5000	5100	464,967.60	2371334776				232483801.6	232483801.6
		5200	5300	817,901.85	4334879783				572531292	572531292
		5400	5500	264,639.28	1455516039				238175351.8	238175351.8
		5600	5700	52,684.91	300303959.6				57953395.72	57953395.72
				2129354.836	11030750936	5180.325397			1235718691	1235718691

RESULTS AA ELA (median alt, shortcut method) = 5180
AA ELA (long method, if exact contour) =
AA ELA (long method, if not exact contour) =
ABBR ELA (exact contour ELA) =
AABR ELA (contour plus proportion of belt) =

Glacier number or name	Contour vertical interval (VI)	Lowest contour altitude	Mean belt altitude	Contour belt area	Mean altitude x Area	MEDIAN ALT (Sum alts x areas)/ sum areas	Balance Ratio	Reference contour (1)	Belt area x Alt above ref. contour (1)	Area x Alt x Balance Ratio for belt 2
22w	200	5000	5100	96,588.29	492600282.2			2 5000	9658829.063	9658829.063
		5200	5300	409,762.27	2171740013				122928680	122928680
		5400	5500	158,036.25	869199364.6				79018124.05	79018124.05
		5600	5700	70,359.79	401050784.2				49251850.69	49251850.69
				734746.592	3934590444	5355.030546			260857483.8	260857483.8

RESULTS AA ELA (median alt, shortcut method) = 5355
AA ELA (long method, if exact contour) =
AA ELA (long method, if not exact contour) =
ABBR ELA (exact contour ELA) =
AABR ELA (contour plus proportion of belt) =

Glacier number or name	Contour vertical interval (VI)	Lowest contour altitude	Mean belt altitude	Contour belt area	Mean altitude x Area	MEDIAN ALT (Sum alts x areas)/ sum areas	Balance Ratio	Reference contour (1)	Belt area x Alt above ref. contour (1)	Area x Alt x Balance Ratio for belt 2
23w	200	4600	4700	99,132.11	465920906.5			2 4600	9913210.777	9913210.777
		4800	4900	574,417.91	2814647766				172325373.4	172325373.4
		5000	5100	467,338.00	2383423792				233668999.2	233668999.2
		5200	5300	542,088.12	2873067019				379461681.7	379461681.7
		5400	5500	233,370.23	1283536251				210033204.7	210033204.7
		5600	5700	41,117.13	234367634.2				45228841.69	45228841.69
				1957463.491	10054963368	5136.730987			1050631311	1050631311

RESULTS AA ELA (median alt, shortcut method) = 5136
AA ELA (long method, if exact contour) =
AA ELA (long method, if not exact contour) =
ABBR ELA (exact contour ELA) =
AABR ELA (contour plus proportion of belt) =

Glacier number or name	Contour vertical interval (VI)	Lowest contour altitude	Mean belt altitude	Contour belt area	Mean altitude x Area	MEDIAN ALT (Sum alts x areas)/ sum areas	Balance Ratio	Reference contour (1)	Belt area x Alt above ref. contour (1)	Area x Alt x Balance Ratio for belt 2
24w	200	4800	4900	304,442.99	1491770669			2 4800	30444299.37	30444299.37
		5000	5100	605,040.33	3085705667				181512098.1	181512098.1
		5200	5300	594,254.08	3149546633				297127040.8	297127040.8
		5400	5500	306,370.76	1685039206				214459535.3	214459535.3
		5600	5700	135,778.51	773937504.7				122200658.6	122200658.6
				1945886.676	10185999679	5234.631493			845743632.2	845743632.2

RESULTS AA ELA (median alt, shortcut method) = 5234
AA ELA (long method, if exact contour) =
AA ELA (long method, if not exact contour) =
ABBR ELA (exact contour ELA) =
AABR ELA (contour plus proportion of belt) =

Glacier number or name	Contour vertical interval (VI)	Lowest contour altitude	Mean belt altitude	Contour belt area	Mean altitude x Area	MEDIAN ALT (Sum alts x areas)/ sum areas	Balance Ratio	Reference contour (1)	Belt area x Alt above ref. contour (1)	Area x Alt x Balance Ratio for belt 2
25w	200	4200	4300	64,609.62	277821374.3			2 4200	6460962.193	6460962.193
		4400	4500	345,174.20	1553283902				103552260.1	103552260.1
		4600	4700	681,878.67	3204829755				340939335.7	340939335.7
		4800	4900	1,134,506.61	5559082386				794154626.5	794154626.5
		5000	5100	1,016,850.07	5185935351				915165061.9	915165061.9
		5200	5300	570,172.01	3021911663				627189213.1	627189213.1
		5400	5500	234,687.61	1290781845				305093890.5	305093890.5
		5600	5700	164,731.07	938967085.1				247096601.3	247096601.3
		5800	5900	130,697.75	771116719.1				222186173.3	222186173.3
				4343307.608	21803730080	5020.075032			3561838125	3561838125

RESULTS AA ELA (median alt, shortcut method) = 5020
AA ELA (long method, if exact contour) =
AA ELA (long method, if not exact contour) =
ABBR ELA (exact contour ELA) =
AABR ELA (contour plus proportion of belt) =

Glacier number or name	Contour vertical interval (VI)	Lowest contour altitude	Mean belt altitude	Contour belt area	Mean altitude x Area	MEDIAN ALT (Sum alts x areas)/ sum areas	Balance Ratio	Reference contour (1)	Belt area x Alt above ref. contour (1)	Area x Alt x Balance Ratio for belt 2
26w	200	4800	4900	33,519.15	164243846.5			2 4800	3351915.234	3351915.234
		5000	5100	281,077.77	1433496617				84323330.4	84323330.4
		5200	5300	551,848.25	2924795746				275924126.9	275924126.9
		5400	5500	568,184.89	3125016869				397729419.7	397729419.7
		5600	5700	288,540.18	1644679002				259686158.1	259686158.1
		5800	5900	69,600.89	410645234.5				76560975.93	76560975.93
				1792771.122	9702877314	5412.223118			1097575926	1097575926

RESULTS AA ELA (median alt, shortcut method) = 5412
AA ELA (long method, if exact contour) =
AA ELA (long method, if not exact contour) =
ABBR ELA (exact contour ELA) =
AABR ELA (contour plus proportion of belt) =

Glacier number or name	Contour vertical interval (VI)	Lowest contour altitude	Mean belt altitude	Contour belt area	Mean altitude x Area	MEDIAN ALT (Sum alts x areas)/ sum areas	Balance Ratio	Reference contour (1)	Belt area x Alt above ref. contour (1)	Area x Alt x Balance Ratio for belt 2
27w	200	4400	4500	12,500.35	56251587.57			2 4400	1250035.279	1250035.279
		4600	4700	557,788.73	2621607029				167336618.8	167336618.8
		4800	4900	690,005.44	3381026660				345002720.4	345002720.4
		5000	5100	1,060,266.09	5407357035				742186259.7	742186259.7
		5200	5300	546,118.03	2894425549				491506225.3	491506225.3
		5400	5500	255,233.35	1403783432				280756686.5	280756686.5
		5600	5700	175,717.79	1001591392				228433124.4	228433124.4
				3297629.776	16766042683	5084.270771			2256471670	2256471670

RESULTS AA ELA (median alt, shortcut method) = 5084
AA ELA (long method, if exact contour) =
AA ELA (long method, if not exact contour) =
ABBR ELA (exact contour ELA) =
AABR ELA (contour plus proportion of belt) =

Glacier number or name	Contour vertical interval (VI)	Lowest contour altitude	Mean belt altitude	Contour belt area	Mean altitude x Area	MEDIAN ALT (Sum alts x areas)/ sum areas	Balance Ratio	Reference contour (1)	Belt area x Alt above ref. contour (1)	Area x Alt x Balance Ratio for belt 2
28w	200	5000	5100	15,204.11	77540969.09			2 5000	1520411.159	1520411.159
		5200	5300	285,626.80	1513822026				85688039.22	85688039.22
		5400	5500	614,021.02	3377115605				307010509.5	307010509.5
		5600	5700	528,624.58	3013160115				370037207.1	370037207.1
				1443476.51	7981638715	5529.455216			764256167	764256167

RESULTS AA ELA (median alt, shortcut method) = 5529
AA ELA (long method, if exact contour) =
AA ELA (long method, if not exact contour) =
ABBR ELA (exact contour ELA) =
AABR ELA (contour plus proportion of belt) =

Glacier number or name	Contour vertical interval (VI)	Lowest contour altitude	Mean belt altitude	Contour belt area	Mean altitude x Area	MEDIAN ALT (Sum alts x areas)/ sum areas	Balance Ratio	Reference contour (1)	Belt area x Alt above ref. contour (1)	Area x Alt x Balance Ratio for belt 2
29w	200	5000	5100	78,014.73	397875125.1			2 5000	7801473.042	7801473.042
		5200	5300	385,583.74	2043593798				115675120.6	115675120.6
		5400	5500	585,347.16	3219409360				292673578.2	292673578.2
		5600	5700	355,685.48	2027407253				248979838.1	248979838.1
		5800	5900	8,362.37	49337996.19				7526135.012	7526135.012
				1412993.477	7737623532	5476.050425			672656145	672656145

RESULTS AA ELA (median alt, shortcut method) = 5476
AA ELA (long method, if exact contour) =
AA ELA (long method, if not exact contour) =
ABBR ELA (exact contour ELA) =
AABR ELA (contour plus proportion of belt) =

Glacier number or name	Contour vertical interval (VI)	Lowest contour altitude	Mean belt altitude	Contour belt area	Mean altitude x Area	MEDIAN ALT (Sum alts x areas)/ sum areas	Balance Ratio	Reference contour (1)	Belt area x Alt above ref. contour (1)	Area x Alt x Balance Ratio for belt 2
30w	200	4200	4300	57,644.70	247872227.8			2 4200	5764470.413	5764470.413
		4400	4500	332,607.95	1496735782				99782385.49	99782385.49
		4600	4700	1,258,309.11	5914052828				629154556.2	629154556.2
		4800	4900	1,334,272.50	6537935264				933990752	933990752
		5000	5100	1,101,261.61	5616434226				991135451.7	991135451.7
		5200	5300	1,346,580.01	7136874059				1481238012	1481238012
		5400	5500	1,929,668.11	10613174618				2508568546	2508568546
		5600	5700	1,096,730.52	6251363992				1645095787	1645095787
		5800	5900	46,930.83	276891924.7				79782418.98	79782418.98
				8504005.367	44091334923	5184.772706			8374512381	8374512381

RESULTS AA ELA (median alt, shortcut method) = 5184
AA ELA (long method, if exact contour) =
AA ELA (long method, if not exact contour) =
ABBR ELA (exact contour ELA) =
AABR ELA (contour plus proportion of belt) =

Quadrant IV

Glacier number or name	Contour vertical interval (VI)	Lowest contour altitude	Mean belt altitude	Contour belt area	Mean altitude x Area	MEDIAN ALT (Sum alts x areas)/ sum areas	Balance Ratio	Reference contour (1)	Belt area x Alt above ref. contour (1)	Area x Alt x Balance Ratio for belt 2
40w	200	4800	4900	170,871.33	837269497			2 4800	17087132.59	17087132.59
		5000	5100	954,635.54	4868641246				286390661.5	286390661.5
		5200	5300	523,400.39	2774022049				261700193.3	261700193.3
		5400	5500	49,162.65	270394563.9				34413853.59	34413853.59
				1698069.899	8750327355	5153.101979			599591841	599591841

RESULTS AA ELA (median alt, shortcut method) = 5153
AA ELA (long method, if exact contour) =
AA ELA (long method, if not exact contour) =
ABBR ELA (exact contour ELA) =
AABR ELA (contour plus proportion of belt) =

Glacier number or name	Contour vertical interval (VI)	Lowest contour altitude	Mean belt altitude	Contour belt area	Mean altitude x Area	MEDIAN ALT (Sum alts x areas)/ sum areas	Balance Ratio	Reference contour (1)	Belt area x Alt above ref. contour (1)	Area x Alt x Balance Ratio for belt 2
41w	200	4600	4700	82,202.76	386352964.5			2 4600	8220275.841	8220275.841
		4800	4900	305,485.70	1496879942				91645710.75	91645710.75
		5000	5100	630,114.18	3213582319				315057090.1	315057090.1
		5200	5300	1,240,791.78	6576196455				868554248.8	868554248.8
		5400	5500	467,798.83	2572893565				421018947	421018947
				2726393.255	14245905246	5225.183571			1704496272	1704496272

RESULTS AA ELA (median alt, shortcut method) = 5225
AA ELA (long method, if exact contour) =
AA ELA (long method, if not exact contour) =
ABBR ELA (exact contour ELA) =
AABR ELA (contour plus proportion of belt) =

Glacier number or name	Contour vertical interval (VI)	Lowest contour altitude	Mean belt altitude	Contour belt area	Mean altitude x Area	MEDIAN ALT (Sum alts x areas)/ sum areas	Balance Ratio	Reference contour (1)	Belt area x Alt above ref. contour (1)	Area x Alt x Balance Ratio for belt 2
42w	200	4800	4900	92,759.44	454521269.2			2 4800	9275944.269	9275944.269
		5000	5100	653,937.91	3335083354				196181373.8	196181373.8
		5200	5300	1,436,323.27	7623113315				719161633.5	719161633.5
		5400	5500	1,452,550.30	7989026637				1016785208	1016785208
		5600	5700	72,285.35	412026499.7				65056815.74	65056815.74
				3709856.271	19813771076	5340.846014			2006460976	2006460976

RESULTS AA ELA (median alt, shortcut method) = 5340
AA ELA (long method, if exact contour) =
AA ELA (long method, if not exact contour) =
ABBR ELA (exact contour ELA) =
AABR ELA (contour plus proportion of belt) =

Glacier number or name	Contour vertical interval (VI)	Lowest contour altitude	Mean belt altitude	Contour belt area	Mean altitude x Area	MEDIAN ALT (Sum alts x areas)/ sum areas	Balance Ratio	Reference contour (1)	Belt area x Alt above ref. contour (1)	Area x Alt x Balance Ratio for belt 2
43w	200	4800	4900	71,010.24	347950186.3			2 4800	7101024.211	7101024.211
		5000	5100	244,469.85	1246796249				73340955.81	73340955.81
		5200	5300	285,744.14	1514443955				142872071.3	142872071.3
		5400	5500	668,342.91	3675886005				467840037	467840037
		5600	5700	39,544.31	225402541.7				35589875	35589875
				1309111.453	7010478937	5355.142927			726743963.3	726743963.3

RESULTS AA ELA (median alt, shortcut method) = 5355
AA ELA (long method, if exact contour) =
AA ELA (long method, if not exact contour) =
ABBR ELA (exact contour ELA) =
AABR ELA (contour plus proportion of belt) =

Glacier number or name	Contour vertical interval (VI)	Lowest contour altitude	Mean belt altitude	Contour belt area	Mean altitude x Area	MEDIAN ALT (Sum alts x areas)/ sum areas	Balance Ratio	Reference contour (1)	Belt area x Alt above ref. contour (1)	Area x Alt x Balance Ratio for belt 2
44w	200	4200	4300	787,020.07	3384186309			2 4200	78702007.18	78702007.18
		4400	4500	2,132,922.39	9598150770				639876718	639876718
		4600	4700	2,900,891.94	13634192097				1450445968	1450445968
		4800	4900	3,285,287.02	16097906404				2299700915	2299700915
		5000	5100	3,554,978.81	18130391940				3199480931	3199480931
		5200	5300	3,018,752.47	15999388074				3320627713	3320627713
		5400	5500	1,667,621.54	9171918457				2167907999	2167907999
		5600	5700	368,752.71	2101890433				553129061.4	553129061.4
		5800	5900	47,867.52	282418347.9				81374778.21	81374778.21
				17764094.46	88400442831	4976.355143			13791246090	13791246090

RESULTS AA ELA (median alt, shortcut method) = 4976
AA ELA (long method, if exact contour) =
AA ELA (long method, if not exact contour) =
ABBR ELA (exact contour ELA) =
AABR ELA (contour plus proportion of belt) =

Glacier number or name	Contour vertical interval (VI)	Lowest contour altitude	Mean belt altitude	Contour belt area	Mean altitude x Area	MEDIAN ALT (Sum alts x areas)/ sum areas	Balance Ratio	Reference contour (1)	Belt area x Alt above ref. contour (1)	Area x Alt x Balance Ratio for belt 2
45w	200	4400	4500	55,741.05	250834744.2			2 4400	5574105.427	5574105.427
		4600	4700	1,234,045.68	5800014709				370213704.8	370213704.8
		4800	4900	1,491,950.70	7310558419				745975348.9	745975348.9
		5000	5100	3,161,295.84	16122608786				2212907088	2212907088
		5200	5300	3,108,461.39	16474845384				2797615254	2797615254
		5400	5500	2,208,938.36	12149160960				2429832192	2429832192
		5600	5700	1,670,583.09	9522323628				2171758020	2171758020
		5800	5900	195,491.25	1153398353				293236869.3	293236869.3
				13126507.36	68783744982	5240.06448			11027112583	11027112583

RESULTS AA ELA (median alt, shortcut method) = 5240
AA ELA (long method, if exact contour) =
AA ELA (long method, if not exact contour) =
ABBR ELA (exact contour ELA) =
AABR ELA (contour plus proportion of belt) =

Glacier number or name	Contour vertical interval (VI)	Lowest contour altitude	Mean belt altitude	Contour belt area	Mean altitude x Area	MEDIAN ALT (Sum alts x areas)/ sum areas	Balance Ratio	Reference contour (1)	Belt area x Alt above ref. contour (1)	Area x Alt x Balance Ratio for belt 2
46w	200	4400	4500	13,700.22	61650981.75			2 4400	1370021.817	1370021.817
		4600	4700	709,459.99	3334461962				212837997.6	212837997.6
		4800	4900	880,026.08	4312127775				440013038.2	440013038.2
		5000	5100	1,425,696.59	7271052595				997987611.1	997987611.1
		5200	5300	1,363,162.60	7224761804				1226846344	1226846344
		5400	5500	1,740,967.63	9575321940				1915064388	1915064388
		5600	5700	2,511,220.77	14313958410				3264587006	3264587006
		5800	5900	1,050,626.60	6198696928				1575939897	1575939897
		6000	6100	185,559.65	1131913862				315451404.3	315451404.3
				9880420.125	53423946258	5407.052087			9950097708	9950097708

RESULTS AA ELA (median alt, shortcut method) = 5407
AA ELA (long method, if exact contour) =
AA ELA (long method, if not exact contour) =
ABBR ELA (exact contour ELA) =
AABR ELA (contour plus proportion of belt) =

Glacier number or name	Contour vertical interval (VI)	Lowest contour altitude	Mean belt altitude	Contour belt area	Mean altitude x Area	MEDIAN ALT (Sum alts x areas)/ sum areas	Balance Ratio	Reference contour (1)	Belt area x Alt above ref. contour (1)	Area x Alt x Balance Ratio for belt 2
47w	200	4400	4500	5,181.87	23318423.11			2 4400	518187.1802	518187.1802
		4600	4700	563,094.59	2646544565				168928376.5	168928376.5
		4800	4900	1,570,415.75	7695037175				785207874.9	785207874.9
		5000	5100	1,631,207.08	8319156102				1141844955	1141844955
		5200	5300	2,002,727.52	10614455864				1802454769	1802454769
		5400	5500	2,101,558.51	11558571832				2311714366	2311714366
		5600	5700	1,216,614.12	6934700497				1581598359	1581598359
		5800	5900	768,662.05	4535106099				1152993076	1152993076
		6000	6100	225,104.20	1373135630				382677142.9	382677142.9
				10084565.7	53700026187	5324.971623			9327937107	9327937107

RESULTS AA ELA (median alt, shortcut method) = 5324
AA ELA (long method, if exact contour) =
AA ELA (long method, if not exact contour) =
ABBR ELA (exact contour ELA) =
AABR ELA (contour plus proportion of belt) =

Glacier number or name	Contour vertical interval (VI)	Lowest contour altitude	Mean belt altitude	Contour belt area	Mean altitude x Area	MEDIAN ALT (Sum alts x areas)/ sum areas	Balance Ratio	Reference contour (1)	Belt area x Alt above ref. contour (1)	Area x Alt x Balance Ratio for belt 2
48w	200	4400	4500	224,786.56	1011539507			2 4400	22478655.71	22478655.71
		4600	4700	1,217,081.48	5720282949				365124443.6	365124443.6
		4800	4900	1,131,677.53	5545219885				565838763.8	565838763.8
		5000	5100	1,136,153.69	5794383829				795307584.4	795307584.4
		5200	5300	1,922,049.93	10186864621				1729844936	1729844936
		5400	5500	2,576,929.67	14173113182				2834622636	2834622636
		5600	5700	2,409,394.62	13733549349				3132213010	3132213010
		5800	5900	1,394,446.76	8227235869				2091670136	2091670136
				12012520.23	64392189192	5360.422954			11537100165	11537100165

RESULTS AA ELA (median alt, shortcut method) = 5360
AA ELA (long method, if exact contour) =
AA ELA (long method, if not exact contour) =
ABBR ELA (exact contour ELA) =
AABR ELA (contour plus proportion of belt) =

Glacier number or name	Contour vertical interval (VI)	Lowest contour altitude	Mean belt altitude	Contour belt area	Mean altitude x Area	MEDIAN ALT (Sum alts x areas)/ sum areas	Balance Ratio	Reference contour (1)	Belt area x Alt above ref. contour (1)	Area x Alt x Balance Ratio for belt 2
49w	200	4200	4300	280,467.57	1206010561			2 4200	28046757.24	28046757.24
		4400	4500	849,250.81	3821628649				254775243.3	254775243.3
		4600	4700	1,970,293.03	9260377235				985146514.4	985146514.4
		4800	4900	1,981,897.48	9711297655				1387328236	1387328236
		5000	5100	1,654,516.67	8438035027				1489065005	1489065005
		5200	5300	2,082,067.42	11034957301				2290274157	2290274157
		5400	5500	2,001,510.12	11008305659				2601963156	2601963156
		5600	5700	2,706,608.58	15427668933				4059912877	4059912877
		5800	5900	1,669,281.06	9848758253				2837777802	2837777802
				15195892.74	79757039274	5248.59188			15934289748	15934289748

RESULTS AA ELA (median alt, shortcut method) = 5248
AA ELA (long method, if exact contour) =
AA ELA (long method, if not exact contour) =
ABBR ELA (exact contour ELA) =
AABR ELA (contour plus proportion of belt) =

Glacier number or name	Contour vertical interval (VI)	Lowest contour altitude	Mean belt altitude	Contour belt area	Mean altitude x Area	MEDIAN ALT (Sum alts x areas)/ sum areas	Balance Ratio	Reference contour (1)	Belt area x Alt above ref. contour (1)	Area x Alt x Balance Ratio for belt 2
50w	200	4200	4300	223,925.56	962879911.5			2 4200	22392556.08	22392556.08
		4400	4500	606,242.02	2728089104				181872606.9	181872606.9
		4600	4700	1,114,196.31	5236722654				557098154.6	557098154.6
		4800	4900	1,896,004.48	9290421963				1327203138	1327203138
		5000	5100	2,459,784.69	12544901896				2213806217	2213806217
		5200	5300	2,732,669.65	14483149124				3005936611	3005936611
		5400	5500	2,637,366.24	14505514305				3428576108	3428576108
		5600	5700	2,455,711.35	13997554690				3683567024	3683567024
		5800	5900	2,445,922.45	14430942466				4158068168	4158068168
		6000	6100	1054934.497	6435100434				2004375545	2004375545
		6200	6300	312,355.93	1967842371				655947457	655947457
				17939113.17	96583118918	5383.940554			21238843585	21238843585

RESULTS AA ELA (median alt, shortcut method) = 5383
AA ELA (long method, if exact contour) =
AA ELA (long method, if not exact contour) =
ABBR ELA (exact contour ELA) =
AABR ELA (contour plus proportion of belt) =

The Bend

Glacier number or name	Contour vertical interval (VI)	Lowest contour altitude	Mean belt altitude	Contour belt area	Mean altitude x Area	MEDIAN ALT (Sum alts x areas)/ sum areas	Balance Ratio	Reference contour (1)	Belt area x Alt above ref. contour (1)	Area x Alt x Balance Ratio for belt 2
31w	200	4400	4500	483,225.33	2174513965			2 4400	48322532.56	48322532.56
		4600	4700	844,664.01	3969920845				253399202.8	253399202.8
		4800	4900	1,520,324.80	7449591525				760162400.5	760162400.5
		5000	5100	2,294,524.93	11702077150				1606167452	1606167452
		5200	5300	2,536,817.25	13445131432				2283135526	2283135526
		5400	5500	1,570,823.04	8639526736				1727905347	1727905347
		5600	5700	734,299.42	4185506700				954589247.3	954589247.3
		5800	5900	716,928.44	4229877825				1075392667	1075392667
		6000	6100	147,997.52	902784873.1				251595784.3	251595784.3
				10849604.75	56698931051	5225.898304			8960670160	8960670160

RESULTS AA ELA (median alt, shortcut method) = 5225
AA ELA (long method, if exact contour) =
AA ELA (long method, if not exact contour) =
ABBR ELA (exact contour ELA) =
AABR ELA (contour plus proportion of belt) =

Glacier number or name	Contour vertical interval (VI)	Lowest contour altitude	Mean belt altitude	Contour belt area	Mean altitude x Area	MEDIAN ALT (Sum alts x areas)/ sum areas	Balance Ratio	Reference contour (1)	Belt area x Alt above ref. contour (1)	Area x Alt x Balance Ratio for belt 2
32w	200	4600	4700	335,117.45	1575052014			2 4600	33511744.97	33511744.97
		4800	4900	607,367.24	2976099458				182210170.9	182210170.9
		5000	5100	748,503.95	3817370143				374251974.8	374251974.8
		5200	5300	453,785.88	2405065161				317650115.7	317650115.7
		5400	5500	44,563.22	245097684.3				40106893.8	40106893.8
				2189337.731	11018684461	5032.884743			947730900.2	947730900.2

RESULTS AA ELA (median alt, shortcut method) = 5032
AA ELA (long method, if exact contour) =
AA ELA (long method, if not exact contour) =
ABBR ELA (exact contour ELA) =
AABR ELA (contour plus proportion of belt) =

Glacier number or name	Contour vertical interval (VI)	Lowest contour altitude	Mean belt altitude	Contour belt area	Mean altitude x Area	MEDIAN ALT (Sum alts x areas)/ sum areas	Balance Ratio	Reference contour (1)	Belt area x Alt above ref. contour (1)	Area x Alt x Balance Ratio for belt 2
33w	200	4400	4500	42,644.66	191900989.1			2 4400	4264466.424	4264466.424
		4600	4700	1,038,505.29	4880974867				311551587.2	311551587.2
		4800	4900	2,120,304.14	10389490264				1060152068	1060152068
		5000	5100	2,860,847.30	14590321225				2002593109	2002593109
		5200	5300	3,677,718.24	19491906674				3309946416	3309946416
		5400	5500	2,651,620.33	14583911825				2916782365	2916782365
		5600	5700	304,019.60	1732911692				395225473.6	395225473.6
				12695659.56	65861417536	5187.711378			10000515486	10000515486

RESULTS AA ELA (median alt, shortcut method) = 5187
AA ELA (long method, if exact contour) =
AA ELA (long method, if not exact contour) =
ABBR ELA (exact contour ELA) =
AABR ELA (contour plus proportion of belt) =

Glacier number or name	Contour vertical interval (VI)	Lowest contour altitude	Mean belt altitude	Contour belt area	Mean altitude x Area	MEDIAN ALT (Sum alts x areas)/ sum areas	Balance Ratio	Reference contour (1)	Belt area x Alt above ref. contour (1)	Area x Alt x Balance Ratio for belt 2
34w	200	4800	4900	66,996.72	328283946.9			2 4800	6699672.385	6699672.385
		5000	5100	966,653.01	4929930372				289995904.2	289995904.2
		5200	5300	1,830,790.61	9703190244				915395306	915395306
		5400	5500	1,194,953.87	6572246312				836467712.4	836467712.4
		5600	5700	627,165.18	3574841516				564448660.4	564448660.4
				4686559.403	25108492389	5357.553427			2613007255	2613007255

RESULTS AA ELA (median alt, shortcut method) = 5357
AA ELA (long method, if exact contour) =
AA ELA (long method, if not exact contour) =
ABBR ELA (exact contour ELA) =
AABR ELA (contour plus proportion of belt) =

Glacier number or name	Contour vertical interval (VI)	Lowest contour altitude	Mean belt altitude	Contour belt area	Mean altitude x Area	MEDIAN ALT (Sum alts x areas)/ sum areas	Balance Ratio	Reference contour (1)	Belt area x Alt above ref. contour (1)	Area x Alt x Balance Ratio for belt 2
35w	200	4400	4500	688,969.87	3100364428			2 4400	68896987.28	68896987.28
		4600	4700	2,057,782.00	9671575398				617334599.8	617334599.8
		4800	4900	2,199,119.73	10775686695				1099559867	1099559867
		5000	5100	3,705,341.54	18897241839				2593739076	2593739076
		5200	5300	4,379,240.81	23209976301				3941316730	3941316730
		5400	5500	4,177,403.48	22975719144				4595143829	4595143829
		5600	5700	71,074.68	405125695.5				92397088.44	92397088.44
				17278932.12	89035689499	5152.846767			13008388177	13008388177

RESULTS AA ELA (median alt, shortcut method) = 5152
AA ELA (long method, if exact contour) =
AA ELA (long method, if not exact contour) =
ABBR ELA (exact contour ELA) =
AABR ELA (contour plus proportion of belt) =

Glacier number or name	Contour vertical interval (VI)	Lowest contour altitude	Mean belt altitude	Contour belt area	Mean altitude x Area	MEDIAN ALT (Sum alts x areas)/ sum areas	Balance Ratio	Reference contour (1)	Belt area x Alt above ref. contour (1)	Area x Alt x Balance Ratio for belt 2
36w	200	4400	4500	359,332.05	1616994221			2 4400	35933204.91	35933204.91
		4600	4700	1,055,278.73	4959810028				316583618.8	316583618.8
		4800	4900	2,096,709.16	10273874862				1048354578	1048354578
		5000	5100	2,664,404.31	13588461989				1865083018	1865083018
		5200	5300	2,097,174.28	11115023664				1887456849	1887456849
		5400	5500	817,885.85	4498372195				899674439.1	899674439.1
				9090784.375	46052536959	5065.848562			6053085707	6053085707

RESULTS AA ELA (median alt, shortcut method) = 5065
AA ELA (long method, if exact contour) =
AA ELA (long method, if not exact contour) =
ABBR ELA (exact contour ELA) =
AABR ELA (contour plus proportion of belt) =

Glacier number or name	Contour vertical interval (VI)	Lowest contour altitude	Mean belt altitude	Contour belt area	Mean altitude x Area	MEDIAN ALT (Sum alts x areas)/ sum areas	Balance Ratio	Reference contour (1)	Belt area x Alt above ref. contour (1)	Area x Alt x Balance Ratio for belt 2
37w	200	4800	4900	25,297.15	123956045.2			2 4800	2529715.208	2529715.208
		5000	5100	433,729.14	2212018617				130118742.2	130118742.2
		5200	5300	625,893.84	3317237353				312946920.1	312946920.1
		5400	5500	740,495.39	4072724651				518346773.8	518346773.8
		5600	5700	131,889.20	751768465.1				118700284	118700284
				1957304.728	10477705131	5353.129219			1082642435	1082642435

RESULTS AA ELA (median alt, shortcut method) = 5353
AA ELA (long method, if exact contour) =
AA ELA (long method, if not exact contour) =
ABBR ELA (exact contour ELA) =
AABR ELA (contour plus proportion of belt) =

Glacier number or name	Contour vertical interval (VI)	Lowest contour altitude	Mean belt altitude	Contour belt area	Mean altitude x Area	MEDIAN ALT (Sum alts x areas)/ sum areas	Balance Ratio	Reference contour (1)	Belt area x Alt above ref. contour (1)	Area x Alt x Balance Ratio for belt 2
38w	200	5000	5100	322,371.51	1644094681			2 5000	32237150.61	32237150.61
		5200	5300	629,303.89	3335310631				188791167.8	188791167.8
		5400	5500	391,888.22	2155385216				195944110.6	195944110.6
		5600	5700	78,073.55	445019213.7				54651482.38	54651482.38
				1421637.166	7579809743	5331.747033			471623911.4	471623911.4

RESULTS AA ELA (median alt, shortcut method) = 5331
AA ELA (long method, if exact contour) =
AA ELA (long method, if not exact contour) =
ABBR ELA (exact contour ELA) =
AABR ELA (contour plus proportion of belt) =

Glacier number or name	Contour vertical interval (VI)	Lowest contour altitude	Mean belt altitude	Contour belt area	Mean altitude x Area	MEDIAN ALT (Sum alts x areas)/ sum areas	Balance Ratio	Reference contour (1)	Belt area x Alt above ref. contour (1)	Area x Alt x Balance Ratio for belt 2
39w	200	4600	4700	65,851.44	309501783.8			2 4600	6585144.337	6585144.337
		4800	4900	940,672.63	4609295894				282201789.4	282201789.4
		5000	5100	2,268,134.18	11567484318				1134067090	1134067090
		5200	5300	2,511,599.29	13311476211				1758119500	1758119500
		5400	5500	1,813,719.86	9975459207				1632347870	1632347870
		5600	5700	136,852.17	780057383				150537389.7	150537389.7
				7736829.568	40553274797	5241.588229			4963858783	4963858783

RESULTS AA ELA (median alt, shortcut method) = 5241
AA ELA (long method, if exact contour) =
AA ELA (long method, if not exact contour) =
ABBR ELA (exact contour ELA) =
AABR ELA (contour plus proportion of belt) =

Glacier number or name	Contour vertical interval (VI)	Lowest contour altitude	Mean belt altitude	Contour belt area	Mean altitude x Area	MEDIAN ALT (Sum alts x areas)/ sum areas	Balance Ratio	Reference contour (1)	Belt area x Alt above ref. contour (1)	Area x Alt x Balance Ratio for belt 2
27e	200	3800	3900	22,269.20	86849881.24			2 3800	2226920.032	2226920.032
		4000	4100	888,830.38	3644204538				266649112.5	266649112.5
		4200	4300	2,685,603.36	11548094447				1342801680	1342801680
		4400	4500	3,971,098.65	17869943924				2779769055	2779769055
		4600	4700	1,883,538.70	8852631893				1695184831	1695184831
		4800	4900	1,315,180.70	6444385429				1446698770	1446698770
		5000	5100	1,376,779.07	7021573271				1789812795	1789812795
		5200	5300	1,188,141.05	6297147578				1782211579	1782211579
		5400	5500	584,987.38	3217430610				994478552.2	994478552.2
		5600	5700	41,436.40	236187506.8				78729168.92	78729168.92
				13957864.9	65218449079	4672.523309			12178562462	12178562462

RESULTS AA ELA (median alt, shortcut method) = 4672
AA ELA (long method, if exact contour) =
AA ELA (long method, if not exact contour) =
ABBR ELA (exact contour ELA) =
AABR ELA (contour plus proportion of belt) =

Glacier number or name	Contour vertical interval (VI)	Lowest contour altitude	Mean belt altitude	Contour belt area	Mean altitude x Area	MEDIAN ALT (Sum alts x areas)/ sum areas	Balance Ratio	Reference contour (1)	Belt area x Alt above ref. contour (1)	Area x Alt x Balance Ratio for belt 2
28e	200	3600	3700	46,619.31	172491448.7			2 3600	4661931.047	4661931.047
		3800	3900	790,724.90	3083827113				237217470.3	237217470.3
		4000	4100	1,836,787.17	7530827415				918393587.2	918393587.2
		4200	4300	3,019,270.20	12982861850				2113489138	2113489138
		4400	4500	3,500,452.12	15752034546				3150406909	3150406909
		4600	4700	1,888,912.83	8877890284				2077804109	2077804109
		4800	4900	1,553,917.44	7614195478				2020092678	2020092678
		5000	5100	769,957.00	3926780704				1154935501	1154935501
		5200	5300	501,374.63	2657285548				852336874	852336874
		5400	5500	56,558.55	311072012.6				107461240.7	107461240.7
				13964574.16	62909266401	4504.918353			12636799439	12636799439

RESULTS AA ELA (median alt, shortcut method) = 4504
AA ELA (long method, if exact contour) =
AA ELA (long method, if not exact contour) =
ABBR ELA (exact contour ELA) =
AABR ELA (contour plus proportion of belt) =

Glacier number or name	Contour vertical interval (VI)	Lowest contour altitude	Mean belt altitude	Contour belt area	Mean altitude x Area	MEDIAN ALT (Sum alts x areas)/ sum areas	Balance Ratio	Reference contour (1)	Belt area x Alt above ref. contour (1)	Area x Alt x Balance Ratio for belt 2
29e	200	3600	3700	221,767.92	820541308.4			2 3600	22176792.12	22176792.12
		3800	3900	1,102,981.63	4301628366				330894489.7	330894489.7
		4000	4100	1,570,803.03	6440292430				785401515.8	785401515.8
		4200	4300	1,275,715.41	5485578270				893000788.1	893000788.1
		4400	4500	1,946,694.43	8760124928				1752024986	1752024986
		4600	4700	1,607,862.79	7556955126				1768649072	1768649072
		4800	4900	838,275.71	4107550957				1089758417	1089758417
		5000	5100	672,231.13	3428378739				1008346688	1008346688
		5200	5300	344,831.98	1827609499				586214367.7	586214367.7
		5400	5500	276,095.48	1518525117				524581403.9	524581403.9
				9857259.505	44247182739	4488.791506			8761048520	8761048520

RESULTS AA ELA (median alt, shortcut method) = 4488
AA ELA (long method, if exact contour) =
AA ELA (long method, if not exact contour) =
ABBR ELA (exact contour ELA) =
AABR ELA (contour plus proportion of belt) =

The Dome

Glacier number or name	Contour vertical interval (VI)	Lowest contour altitude	Mean belt altitude	Contour belt area	Mean altitude x Area	MEDIAN ALT (Sum alts x areas)/ sum areas	Balance Ratio	Reference contour (1)	Belt area x Alt above ref. contour (1)	Area x Alt x Balance Ratio for belt 2
1d	200	4000	4100	110,419.18	452718652.5			2 4000	11041918.35	11041918.35
		4200	4300	265,416.39	1141290459				79624915.71	79624915.71
		4400	4500	309,908.53	1394588373				154954263.7	154954263.7
		4600	4700	17,003.32	79915594.46				11902322.58	11902322.58
				702747.4147	3068513079	4366.45232			257523420.4	257523420.4

RESULTS AA ELA (median alt, shortcut method) = 4366
AA ELA (long method, if exact contour) =
AA ELA (long method, if not exact contour) =
ABBR ELA (exact contour ELA) =
AABR ELA (contour plus proportion of belt) =

Glacier number or name	Contour vertical interval (VI)	Lowest contour altitude	Mean belt altitude	Contour belt area	Mean altitude x Area	MEDIAN ALT (Sum alts x areas)/ sum areas	Balance Ratio	Reference contour (1)	Belt area x Alt above ref. contour (1)	Area x Alt x Balance Ratio for belt 2
2d	200	4200	4300	93,717.99	402987377.6			2 4200	9371799.479	9371799.479
		4400	4500	589,268.04	2651706178				176780411.8	176780411.8
		4600	4700	441,321.64	2074211707				220660819.9	220660819.9
		4800	4900	9,117.30	44674793.92				6382113.417	6382113.417
				1133424.979	5173580056	4564.554472			413195144.6	413195144.6

RESULTS AA ELA (median alt, shortcut method) = 4564
AA ELA (long method, if exact contour) =
AA ELA (long method, if not exact contour) =
ABBR ELA (exact contour ELA) =
AABR ELA (contour plus proportion of belt) =

Glacier number or name	Contour vertical interval (VI)	Lowest contour altitude	Mean belt altitude	Contour belt area	Mean altitude x Area	MEDIAN ALT (Sum alts x areas)/ sum areas	Balance Ratio	Reference contour (1)	Belt area x Alt above ref. contour (1)	Area x Alt x Balance Ratio for belt 2
3d	200	3800	3900	65,867.84	256884589.6			2 3800	6586784.348	6586784.348
		4000	4100	570,853.04	2340497445				171255910.6	171255910.6
		4200	4300	583,764.50	2510187350				291882250	291882250
		4400	4500	527,976.44	2375893976				369583507.3	369583507.3
		4600	4700	99,778.40	468958483.7				89800560.71	89800560.71
				1848240.219	7952421844	4302.699272			929109013	929109013

RESULTS AA ELA (median alt, shortcut method) = 4302
AA ELA (long method, if exact contour) =
AA ELA (long method, if not exact contour) =
ABBR ELA (exact contour ELA) =
AABR ELA (contour plus proportion of belt) =

Glacier number or name	Contour vertical interval (VI)	Lowest contour altitude	Mean belt altitude	Contour belt area	Mean altitude x Area	MEDIAN ALT (Sum alts x areas)/ sum areas	Balance Ratio	Reference contour (1)	Belt area x Alt above ref. contour (1)	Area x Alt x Balance Ratio for belt 2
4d	200	4200	4300	162,195.23	697439486.7		2	4200	16219522.95	16219522.95
		4400	4500	603,671.94	2716523708				181101580.5	181101580.5
		4600	4700	1,305,900.68	6137733173				652950337.6	652950337.6
		4800	4900	57,518.06	281838485.2				40262640.75	40262640.75
				2129285.898	9833534853	4618.231334			890534081.8	890534081.8

RESULTS AA ELA (median alt, shortcut method) = 4618
AA ELA (long method, if exact contour) =
AA ELA (long method, if not exact contour) =
ABBR ELA (exact contour ELA) =
AABR ELA (contour plus proportion of belt) =

Glacier number or name	Contour vertical interval (VI)	Lowest contour altitude	Mean belt altitude	Contour belt area	Mean altitude x Area	MEDIAN ALT (Sum alts x areas)/ sum areas	Balance Ratio	Reference contour (1)	Belt area x Alt above ref. contour (1)	Area x Alt x Balance Ratio for belt 2
5d	200	3400	3500	24,534.53	85870856.15		2	3400	2453453.033	2453453.033
		3600	3700	298,465.47	1104322257				89539642.43	89539642.43
		3800	3900	495,559.52	1932682141				247779761.6	247779761.6
		4000	4100	648,126.30	2657317824				453688408.9	453688408.9
		4200	4300	386,543.79	1662138281				347889407.7	347889407.7
		4400	4500	550,915.86	2479121382				606007448.9	606007448.9
		4600	4700	10,111.47	47523903.78				13144909.56	13144909.56
				2414256.945	9968976644	4129.211129			1760503032	1760503032

RESULTS AA ELA (median alt, shortcut method) = 4129
AA ELA (long method, if exact contour) =
AA ELA (long method, if not exact contour) =
ABBR ELA (exact contour ELA) =
AABR ELA (contour plus proportion of belt) =

Glacier number or name	Contour vertical interval (VI)	Lowest contour altitude	Mean belt altitude	Contour belt area	Mean altitude x Area	MEDIAN ALT (Sum alts x areas)/ sum areas	Balance Ratio	Reference contour (1)	Belt area x Alt above ref. contour (1)	Area x Alt x Balance Ratio for belt 2
6d	200	3200	3300	116,666.01	384997833.4		2	3200	11666601.01	11666601.01
		3400	3500	613,432.05	2147012189				184029616.2	184029616.2
		3600	3700	1,303,544.74	4823115526				651772368.4	651772368.4
		3800	3900	1,811,895.92	7066394093				1268327145	1268327145
		4000	4100	2,595,771.54	10642663294				2336194382	2336194382
		4200	4300	4,223,337.19	18160349903				4645670905	4645670905
		4400	4500	3,346,579.88	15059609472				4350553847	4350553847
		4600	4700	627,788.27	2950604878				941682407.8	941682407.8
		4800	4900	117,743.90	576945103.8				200164627.9	200164627.9
				14756759.5	61811692291	4188.703645			14590061901	14590061901

RESULTS AA ELA (median alt, shortcut method) = 4188
AA ELA (long method, if exact contour) =
AA ELA (long method, if not exact contour) =
ABBR ELA (exact contour ELA) =
AABR ELA (contour plus proportion of belt) =

Glacier number or name	Contour vertical interval (VI)	Lowest contour altitude	Mean belt altitude	Contour belt area	Mean altitude x Area	MEDIAN ALT (Sum alts x areas)/ sum areas	Balance Ratio	Reference contour (1)	Belt area x Alt above ref. contour (1)	Area x Alt x Balance Ratio for belt 2
7d	200	3400	3500	25,110.90	87888142.76			2 3400	2511089.793	2511089.793
		3600	3700	134,283.50	496848937.2				40285048.96	40285048.96
		3800	3900	286,738.81	1118281344				143369403.1	143369403.1
		4000	4100	211,923.74	868887353.8				148346621.4	148346621.4
		4200	4300	18,543.62	79737564.19				16689257.62	16689257.62
				676600.5652	2651643342	3919.067584			351201420.9	351201420.9

RESULTS AA ELA (median alt, shortcut method) = 3919
AA ELA (long method, if exact contour) =
AA ELA (long method, if not exact contour) =
ABBR ELA (exact contour ELA) =
AABR ELA (contour plus proportion of belt) =

Glacier number or name	Contour vertical interval (VI)	Lowest contour altitude	Mean belt altitude	Contour belt area	Mean altitude x Area	MEDIAN ALT (Sum alts x areas)/ sum areas	Balance Ratio	Reference contour (1)	Belt area x Alt above ref. contour (1)	Area x Alt x Balance Ratio for belt 2
8d	200	3600	3700	217,225.83	803735579.8			2 3600	21722583.24	21722583.24
		3800	3900	600,798.93	2343115813				180239678	180239678
		4000	4100	697,135.05	2858253716				348567526.3	348567526.3
		4200	4300	394,061.39	1694463963				275842970.6	275842970.6
		4400	4500	184,179.22	828806497.5				165761299.5	165761299.5
				2093400.42	8528375569	4073.934202			992134057.7	992134057.7

RESULTS AA ELA (median alt, shortcut method) = 4073
AA ELA (long method, if exact contour) =
AA ELA (long method, if not exact contour) =
ABBR ELA (exact contour ELA) =
AABR ELA (contour plus proportion of belt) =

Glacier number or name	Contour vertical interval (VI)	Lowest contour altitude	Mean belt altitude	Contour belt area	Mean altitude x Area	MEDIAN ALT (Sum alts x areas)/ sum areas	Balance Ratio	Reference contour (1)	Belt area x Alt above ref. contour (1)	Area x Alt x Balance Ratio for belt 2
9d	200	3400	3500	2,104.85	7366980.173			2 3400	210485.1478	210485.1478
		3600	3700	71,645.90	265089820				21493769.19	21493769.19
		3800	3900	125,689.44	490188835.1				62844722.44	62844722.44
		4000	4100	178,707.01	732698760.8				125094910.4	125094910.4
		4200	4300	216,589.94	931336746.9				194930947	194930947
				594737.1496	2426681143	4080.258219			404574834.2	404574834.2

RESULTS AA ELA (median alt, shortcut method) = 4080
AA ELA (long method, if exact contour) =
AA ELA (long method, if not exact contour) =
ABBR ELA (exact contour ELA) =
AABR ELA (contour plus proportion of belt) =

Glacier number or name	Contour vertical interval (VI)	Lowest contour altitude	Mean belt altitude	Contour belt area	Mean altitude x Area	MEDIAN ALT (Sum alts x areas)/ sum areas	Balance Ratio	Reference contour (1)	Belt area x Alt above ref. contour (1)	Area x Alt x Balance Ratio for belt 2
10d	200	3600	3700	3,865.55	14302544.34			2 3600	386555.2524	386555.2524
		3800	3900	139,212.98	542930611.6				41763893.2	41763893.2
		4000	4100	298,443.33	1223617639				149221663.3	149221663.3
		4200	4300	701,599.29	3016876948				491119503.2	491119503.2
		4400	4500	425,047.80	1912715086				382543017.2	382543017.2
		4600	4700	28,641.00	134612713.3				31505103.12	31505103.12
				1596809.947	6845055543	4286.706479			1096539735	1096539735

RESULTS AA ELA (median alt, shortcut method) = 4286
AA ELA (long method, if exact contour) =
AA ELA (long method, if not exact contour) =
ABBR ELA (exact contour ELA) =
AABR ELA (contour plus proportion of belt) =

Glacier number or name	Contour vertical interval (VI)	Lowest contour altitude	Mean belt altitude	Contour belt area	Mean altitude x Area	MEDIAN ALT (Sum alts x areas)/ sum areas	Balance Ratio	Reference contour (1)	Belt area x Alt above ref. contour (1)	Area x Alt x Balance Ratio for belt 2
11d	200	4000	4100	132,410.49	542882993.1			2 4000	13241048.61	13241048.61
		4200	4300	369,260.05	1587818200				110778014	110778014
		4400	4500	748,975.27	3370388731				374487636.8	374487636.8
		4600	4700	47,556.83	223517094.7				33289780.06	33289780.06
				1298202.635	5724607019	4409.640579			531796479.4	531796479.4

RESULTS AA ELA (median alt, shortcut method) = 4409
AA ELA (long method, if exact contour) =
AA ELA (long method, if not exact contour) =
ABBR ELA (exact contour ELA) =
AABR ELA (contour plus proportion of belt) =

Glacier number or name	Contour vertical interval (VI)	Lowest contour altitude	Mean belt altitude	Contour belt area	Mean altitude x Area	MEDIAN ALT (Sum alts x areas)/ sum areas	Balance Ratio	Reference contour (1)	Belt area x Alt above ref. contour (1)	Area x Alt x Balance Ratio for belt 2
12d	200	3000	3100	23,849.20	73932532.26			2 3000	2384920.396	2384920.396
		3200	3300	118,249.27	390222577.1				35474779.73	35474779.73
		3400	3500	161,859.10	566506841.1				80929548.73	80929548.73
		3600	3700	234,228.77	866646434				163960136.2	163960136.2
		3800	3900	538,021.03	2098281998				484218922.6	484218922.6
		4000	4100	673,641.82	2761931453				741005999.7	741005999.7
		4200	4300	753,447.99	3239826343				979482382.8	979482382.8
		4400	4500	1,277,798.45	5750093025				1916697675	1916697675
		4600	4700	266,889.62	1254381225				453712357.8	453712357.8
				4047985.235	17001822429	4200.070267			4857866723	4857866723

RESULTS AA ELA (median alt, shortcut method) = 4200
AA ELA (long method, if exact contour) =
AA ELA (long method, if not exact contour) =
ABBR ELA (exact contour ELA) =
AABR ELA (contour plus proportion of belt) =

Glacier number or name	Contour vertical interval (VI)	Lowest contour altitude	Mean belt altitude	Contour belt area	Mean altitude x Area	MEDIAN ALT (Sum alts x areas)/ sum areas	Balance Ratio	Reference contour (1)	Belt area x Alt above ref. contour (1)	Area x Alt x Balance Ratio for belt 2
13d	200	4000	4100	94,729.49	388390897.4			2 4000	9472948.716	9472948.716
		4200	4300	959,051.60	4123921875				287715479.7	287715479.7
		4400	4500	400,601.28	1802705759				200300639.9	200300639.9
		4600	4700	403,895.39	1898308325				282726771.8	282726771.8
		4800	4900	229,260.59	1123376900				206334532.6	206334532.6
		5000	5100	2,714.37	13843301.27				2985810.078	2985810.078
				2090252.719	9350547058	4473.405045			989536182.8	989536182.8

RESULTS AA ELA (median alt, shortcut method) = 4473
AA ELA (long method, if exact contour) =
AA ELA (long method, if not exact contour) =
ABBR ELA (exact contour ELA) =
AABR ELA (contour plus proportion of belt) =

Glacier number or name	Contour vertical interval (VI)	Lowest contour altitude	Mean belt altitude	Contour belt area	Mean altitude x Area	MEDIAN ALT (Sum alts x areas)/ sum areas	Balance Ratio	Reference contour (1)	Belt area x Alt above ref. contour (1)	Area x Alt x Balance Ratio for belt 2
14d	200	4000	4100	99,440.70	407706856.3			2 4000	9944069.667	9944069.667
		4200	4300	207,380.32	891735380.5				62214096.31	62214096.31
		4400	4500	237,081.33	1066866000				118540666.7	118540666.7
		4600	4700	586,919.61	2758522180				410843728.9	410843728.9
		4800	4900	200,681.58	983339718.4				180613417.7	180613417.7
				1331503.539	6108170135	4587.423132			782155979.2	782155979.2

RESULTS AA ELA (median alt, shortcut method) = 4587
AA ELA (long method, if exact contour) =
AA ELA (long method, if not exact contour) =
ABBR ELA (exact contour ELA) =
AABR ELA (contour plus proportion of belt) =

Glacier number or name	Contour vertical interval (VI)	Lowest contour altitude	Mean belt altitude	Contour belt area	Mean altitude x Area	MEDIAN ALT (Sum alts x areas)/ sum areas	Balance Ratio	Reference contour (1)	Belt area x Alt above ref. contour (1)	Area x Alt x Balance Ratio for belt 2
15d	200	4000	4100	190,841.18	782448851.9			2 4000	19084118.34	19084118.34
		4200	4300	175,451.26	754440396.7				52635376.51	52635376.51
		4400	4500	195,390.12	879255548.3				97695060.93	97695060.93
		4600	4700	636,494.12	2991522356				445545882.8	445545882.8
		4800	4900	261,256.43	1280156489				235130783.7	235130783.7
				1459433.105	6687823641	4582.48043			850091222.2	850091222.2

RESULTS AA ELA (median alt, shortcut method) = 4582
AA ELA (long method, if exact contour) =
AA ELA (long method, if not exact contour) =
ABBR ELA (exact contour ELA) =
AABR ELA (contour plus proportion of belt) =

Glacier number or name	Contour vertical interval (VI)	Lowest contour altitude	Mean belt altitude	Contour belt area	Mean altitude x Area	MEDIAN ALT (Sum alts x areas)/ sum areas	Balance Ratio	Reference contour (1)	Belt area x Alt above ref. contour (1)	Area x Alt x Balance Ratio for belt 2
16d	200	4200	4300	360,517.51	1550225291		2	4200	36051750.95	36051750.95
		4400	4500	1,018,487.30	4583192847				305546189.8	305546189.8
		4600	4700	690,147.62	3243693804				345073808.9	345073808.9
		4800	4900	527,036.66	2582479634				368925662	368925662
		5000	5100	299,067.43	1525243884				269160685.5	269160685.5
		5200	5300	14,169.16	75096548.25				15586076.05	15586076.05
				2909425.675	13559932009	4660.690295			1340344173	1340344173

RESULTS AA ELA (median alt, shortcut method) = 4660
AA ELA (long method, if exact contour) =
AA ELA (long method, if not exact contour) =
ABBR ELA (exact contour ELA) =
AABR ELA (contour plus proportion of belt) =

Glacier number or name	Contour vertical interval (VI)	Lowest contour altitude	Mean belt altitude	Contour belt area	Mean altitude x Area	MEDIAN ALT (Sum alts x areas)/ sum areas	Balance Ratio	Reference contour (1)	Belt area x Alt above ref. contour (1)	Area x Alt x Balance Ratio for belt 2
17d	200	4200	4300	85,007.96	365534233.9		2	4200	8500796.137	8500796.137
		4400	4500	535,675.22	2410538497				160702566.5	160702566.5
		4600	4700	988,094.35	4644043461				494047176.7	494047176.7
		4800	4900	322,345.06	1579490802				225641543.1	225641543.1
				1931122.598	8999606995	4660.29811			888892082.5	888892082.5

RESULTS AA ELA (median alt, shortcut method) = 4660
AA ELA (long method, if exact contour) =
AA ELA (long method, if not exact contour) =
ABBR ELA (exact contour ELA) =
AABR ELA (contour plus proportion of belt) =

Glacier number or name	Contour vertical interval (VI)	Lowest contour altitude	Mean belt altitude	Contour belt area	Mean altitude x Area	MEDIAN ALT (Sum alts x areas)/ sum areas	Balance Ratio	Reference contour (1)	Belt area x Alt above ref. contour (1)	Area x Alt x Balance Ratio for belt 2
18d	200	3800	3900	26,655.04	103954652.7		2	3800	2665503.915	2665503.915
		4000	4100	225,342.38	923903744.5				67602713.01	67602713.01
		4200	4300	407,106.09	1750556178				203553043.9	203553043.9
		4400	4500	332,296.66	1495334950				232607658.8	232607658.8
		4600	4700	738,365.50	3470317840				664528948	664528948
		4800	4900	229,954.29	1126776013				252949717.3	252949717.3
				1959719.945	8870843377	4526.58728			1423907585	1423907585

RESULTS AA ELA (median alt, shortcut method) = 4526
AA ELA (long method, if exact contour) =
AA ELA (long method, if not exact contour) =
ABBR ELA (exact contour ELA) =
AABR ELA (contour plus proportion of belt) =